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SESSIONAL PAPERS.

92

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THIRD SESSION OF SEVENTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO.

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SESSION 1893.

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LIST OF SESSIONAL PAPERS.

ARRANGED ALPHABETICALLY.

TITLE.	No.	REMARKS.
Accounts (*Dominion and the Provinces*)	65	*Printed.*
Accounts, Public	14	"
Agricultural and Arts, Report	11	"
Agricultural College, Report	22	"
Agricultural Societies, Analysis	60	*Not printed.*
Anatomy, Inspector, Bodies received by	71	*Printed.*
Asylums, Report	8	"
Baxter, Judge, commutation	33	*Not printed.*
Bee-Keepers' Association, Report	83	*Printed.*
Births, Marriages and Deaths, Report	5	"
Blind Institute, Report	6	"
Bonds and Securities	53	*Not printed.*
Canadian Institute, Report	23	*Printed.*
Cattle, Dehorning, Report	2	"
Central Farmers' Institute, Report	84	"
Cholera regulations	66	"
Colonization Roads and Bridges	78	"
Crown Lands Report	17	"
Dairymen's and Creameries', Report	16	*Printed.*
Deaf and Dumb Institute, Report	7	"
Dehorning Cattle, Report	2	"
Division Courts, Report	26	"
Drainage Commission, Report	32	"
Duffern License Commissioners, correspondence	91	*Not printed.*
Education, Report	3	*Printed.*
" publication of Text-Books, O. in C	42	*Not printed.*
" publication of French Grammar	43	"
" lecturers at School of Pedagogy	44	"
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" Niagara Falls High School	46	"
" Toronto Junction High School	47	"
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" County pupils attending High Schools	52	*Printed.*
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Elections, Returns	75	"
Elgin House of Industry, Report	39	*Not printed.*
Entomological Society, Report	12	*Printed.*
Estimates	15	"

TITLE.	No.	REMARKS.
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Farmers' Institute, Central, Report	84	"
Fire Ranging, expenditure	41	"
Fish and Game, Report	76	"
Forest Reservation and National Park, Report	31	"
Forestry, Forest Schools Management, Report	30	"
Fruit Growers', Report	13	"
Game and Fish, Report	76	*Printed.*
Gaols, Prisons and Reformatories, Report	9	"
Government Roads	78	"
Health, Report	28	*Printed.*
" regulations *re* cholera	66	"
" regulations *re* ice supply	67	"
Hospitals, Report	38	"
Houses of Refuge, Report	10	"
Ice, regulations *re* supply and storage	67	*Printed.*
Immigration, Report	18	"
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Jones *vs.* Sharpe, correspondence	63	"
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Kirkpatrick, Lieutenant-Governor	57	*Printed.*
Lands sold, amounts due on	68	*Printed.*
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Librarian, Report	37	*Not printed.*
Lieutenant-Governor, appointment	57	*Printed.*
Liquor Licenses, Report	19	"
" number issued	49	"
" convictions in N. Ontario	88	*Not printed.*
Magdalen Asylums, Report	10	*Printed.*
Manley, conduct of	51	*Not printed.*
Medical Council, sums paid to members	86	*Printed.*
Middlesex Registry Office, vacancies in	58	*Not printed.*
Mines, Report of Bureau	85	*Printed.*
Mosgrove, Judge, commutation	34	*Not printed.*
Municipal indebtedness	89	*Printed.*
Municipal Taxation, Report	73	"
Municipal Treasurers, defalcations	79	"
Orphan Asylums, Report	10	*Printed.*
Ottawa Separate Schools, correspondence	50	"
Paget and Regan, correspondence	63	*Not printed.*
Pedagogy, lecturers	44	"
Pedgaogy, appointments and dismissals	54	*Printed.*

Title.	No.	Remarks.
Plebiscite Petitions	93	*Printed*
Poultry and Pet Stock, Report	82	"
Prisons, Report	9	"
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Public Works, Report	24	"
Queen Victoria Niagara Falls Park, Report	69	*Printed.*
Railway Documents	59	*Printed.*
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Registrars' fees	81	"
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Secretary and Registrar, Report	90	*Printed.*
Statutes, Revised, disposal of	35	*Not printed.*
Statutes, Sessional, disposal of	36	"
Tavern and Shop Licenses, Report	19	*Printed.*
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Timber berths, offered for sale in 1892	62	"
Timber berths, purchasers in 1890	74	"
Timber sales from 1871	92	"
Timber, estimated quantity	72	"
Titles, Report of Master	61	"
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Toronto Normal School, appointments, etc.	54	*Printed.*
Toronto University, Report	70	"
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" Finance Report	21	"
Upper Canada College, Report	29	*Printed.*
York Branch River Bridge	80	*Not printed.*
York House of Industry, Report	40	"

LIST OF SESSIONAL PAPERS.

Arranged in Numerical Order with their Titles at full length ; the dates when Ordered and when presented to the Legislature ; the name of the Member who moved the same, and whether Ordered to be Printed or not.

CONTENTS OF PART I.

No. 1.. Report of the Standing Committee on the Faculty of Medicine, University of Toronto, on the subject of Re-organization. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 2.. Report of the Commissioners appointed to enquire into the practice of Dehorning Cattle. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 3.. Report of the Minister of Education for the year 1892, with Statistics of 1891, in which is included the Reports upon the Scientific Institutions and School of Practical Science. Presented to the Legislature, 5th April, 1893. (*Printed.*)

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No. 4.. Report of the Inspector of Insurance and Registrar of Friendly Societies for the year 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 5.. Report relating to the Registration of Births, Marriages and Deaths for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

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No. 6.. Report upon the Ontario Institution for the education and instruction of the Blind, Brantford, for the year ending 30th September, 1892. Presented to the Legislature, 5th April, 1893. (*Printed*)

No. 7.. Report upon the Ontario Institution for the education of the Deaf and Dumb, Belleville, for the year ending 30th September, 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 8.. Report upon the Lunatic and Idiot Asylums of the Province for the year ending 30th September, 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 9.. Report upon the Common Gaols, Prisons and Reformatories, for the year ending 30th September, 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 10.. Report upon the Houses of Refuge and Orphan and Magdalen Asylums for the year ending 30th September, 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 11.. Report of the Agriculture and Arts Association for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

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No. 12.. Report of the Entomological Society for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 13.. Report of the Fruit Growers' Association for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 14.. Public Accounts of the Province for the year 1892. Presented to the Legislature, 5th April, 1893. (*Printed.*)

No. 15.. Estimates for the service of the Province until the Estimates of the year are finally passed. Presented to the Legislature, 5th April, 1893. (*Not printed.*) Estimates for the year 1893. Presented to the Legislature, 5th April, 1893. (*Printed.*) Estimates required for the service of the Province until the Estimates for the year are finally passed. Presented to the Legislature, 1st May, 1893. (*Not printed.*) Estimates (supplementary) for the year 1893. Presented to the Legislature, 25th May, 1893. (*Printed.*)

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No. 16.. Report of the Dairymen's and Creameries' Associations of the Province for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 17.. Report of the Commissioner of Crown Lands for the year 1892. Presented to the Legislature, 18th April, 1893. (*Printed.*)

No. 18.. Report of the Department of Immigration for the year 1892. Presented to the Legislature, 5th May, 1893. (*Printed.*)

No. 19.. Report upon the working of the Tavern and Shop Licenses Act for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

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No. 20.. Report of the Bureau of Industries for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 21.. Report of the Standing Committee on Finance, University of Toronto. Presented to the Legislature, 10th April, 1893. (*Printed.*)

No. 22.. Report of the Ontario Agricultural College and Experimental Farm for the year 1892. Presented to the Legislature, 10th April, 1893. (*Printed.*)

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No. 23 . Report for the Canadian Institute for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 24.. Report of the Commissioner of Public Works for the year 1892. Presented to the Legislature, 12th April, 1893. (*Printed.*)

No. 25.. Reports of the Inspectors of Factories of the Province for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 26.. Report of the Inspector of Division Courts for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 27.. Report of the Inspector of Legal Offices for the year 1892. Presented to the Legislature, 2nd May, 1893. (*Printed.*)

No. 28.. Report of the Provincial Board of Health for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 29.. Report of Upper Canada College for the year ending 30th June, 1892. Presented to the Legislature, 6th April, 1893. (*Printed.*)

No. 30.. Papers and Reports upon Forestry, Forest Schools, Administration and Management. Presented to the Legislature, 20th April, 1893. (*Printed.*)

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No. 31.. Report of the Royal Commission on Forest Reservation and National Park. Presented to the Legislature, 20th April, 1893. (*Printed.*)

No. 32.. Report of the Drainage Commission for the Province, 1892-3. Presented to the Legislature, 4th May, 1893. (*Printed.*)

No. 33.. Copy of an Order in Council commuting the fees payable to His Honour Judge Baxter, under the Surrogate Courts Act. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 34.. Copy of an Order in Council respecting the payment of Surrogate Court fees to His Honour, Judge Mosgrove. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 35.. Statement as to the disposal of the Revised Statutes for the year 1892. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 36.. Statement as to the disposal of the Sessional Statutes for the year 1892. Presented to the Legislature, 5th April, 1893. (*Not printed.*)

No. 37.. Report of the Librarian on the state of the Library. Presented to the Legislature, 6th April, 1893. (*Not printed.*)

No. 38.. Report upon the Hospitals of the Province for the year ending 30th September, 1892. Presented to the Legislature, 14th April, 1893. (*Printed.*)

No. 39.. Report of the House of Industry and Refuge, County of Elgin. Presented to the Legislature, 10th April, 1893. (*Not printed.*)

No. 40.. Report on the House of Industry, County of York. Presented to the Legislature, 10th April, 1893. (*Not printed.*)

No. 41.. Return to an Order of the House, of the sixth day of April, 1892, shewing the expenditure in each year, since the system of fire ranging has been established for that service, the amount of refunds in each year, and the amount remaining unpaid on account of the licensee's share of the expenditure. Presented to the Legislature, 10th April, 1893. Mr. *Meredith.* (*Printed.*)

No. 42.. Copy of an Order-in-Council approving of certain agreements in regard to publication of Text Books. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 43.. Copy of an Order-in-Council respecting a certain indenture of agreement in regard to the publication of the High School French Grammar. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 44.. Copy of an Order-in-Council respecting the appointment of Lecturers at the School of Pedagogy for the Session of 1892-93. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 45.. Copy of an Order-inCouncil raising the High School at Goderich to the status of a Collegiate Institute. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 46.. Copy of an Order-in-Council relating to the establishment of a High School at Niagara Falls. Presented to the Legislature, 11th, April, 1893. (*Not printed.*)

No. 47.. Copy of an Order-in-Council respecting the establishment of a High School at Toronto Junction. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 48.. Copy of an Order-in-Council respecting the performance, during his absence through illness, of certain of the duties of the Inspector of Model Schools. Presented to the Legislature, 11th April, 1893. (*Not printed.*)

No. 49.. Return to an Order of the House of the seventeenth day of March, 1892, for a Return shewing the number of liquor licenses issued in each year from 1876 to 1891, both inclusive. The gross fund raised from licenses in each of the same years. The sums paid out of the said fund in each of the same years to the Province and the Municipalities respectively, and the sums the Municipalities have imposed by by-law over and above the Statutory Duties in each of the same years. Presented to the Legislature, 12th April, 1893. Mr. *Clancy.* (*Printed.*)

No. 50.. Return to an Order of the House of the twenty-third day of March, 1892, for a Return of copies of all correspondence between Mr. Inspector White and the Board of Separate School Trustees of the City of Ottawa, together with copies of all reports made by the Inspector to the said Board, with reference to the Separate Schools of the City, during the year 1891. Presented to the Legislature, 12th April, 1893. Mr. *Whitney.* (*Printed.*)

No. 51.. Return to an Order of the House of the twenty-fifth day of March, 1892, for a Return of copies of all correspondence between the Minister of Education, Sir Daniel Wilson, and one Manley, late caretaker or janitor of the School of Practical Science, or any other person or persons, relating to the conduct of said Manley while janitor, and his dismissal from said position. Presented to the Legislature, 12th April, 1893. Mr. *Whitney.* (*Not printed.*)

No. 52.. Return to an Order of the House of the eleventh day of April, 1892, for a Return shewing the number of County pupils attending High Schools or Collegiate Institutes in Towns separated from Counties for Municipal purposes, for each of the past three years ending 30th June; the amounts paid by said Counties to the said High Schools and Collegiate Institutes

for the same period; the amounts paid by said Counties to the said High Schools and Collegiate Institutes under the High Schools Act of 1891. Presented to the Legislature, 12th April, 1893. Mr. *Preston.* (*Printed*)

No. 53.. Statement of Bonds and Securities registered by Officers of the Province during the year 1892. Presented to the Legislature, 14th April, 1893. (*Not printed.*)

No. 54.. Return to an Order of the House of the twenty-fifth day of March, 1892, for a Return giving the names of all persons who have been appointed to, who have resigned and been dismissed from positions in the Toronto Normal School, the Toronto Model School and the School of Pedagogy, within the last five years, together with copies, in each case, of all correspondence relating to the same between the Minister of Education or any member of the Government, or any officer of the Department of Education and the parties in question, or any other person or persons. Also, copies of all petitions, memorials and communications addressed to the Minister of Education, or any member of the Government, on the part of any, or all of the students of the Toronto Normal School, the Toronto Model School and the School of Pedagogy, within the last five years, and of any replies thereto on the Department of Education or the Government. Presented to the Legislature, 14th April, 1893. Mr. *Whitney.* (*Printed.*)

No. 55 .. Return to an Order of the House of the fourth day of April, 1892, for a Return shewing the names of all authors and publishers of Public and High School text-books, with the respective books published by them and the prices thereof. Also, for the copies of all correspondence by or with the Minister of Education, or any officer of his department, respecting the price or publication of Public or High School text-books, subsequent to that already brought down. Presented to the Legislature, 14th April, 1893. Mr. *Kerns.* (*Printed.*)

No. 56.. Report of the Toronto General Trusts Company for the year 1892. Presented to the Legislature, 17th April, 1893. (*Not printed.*)

No. 57.. Copy of Commission appointing the Honourable George Airey Kirkpatrick, P.C., to be Lieutenant-Governor of the Province of Ontario, and of the instructions thereto attached. Presented to the Legislature, 20th April, 1893. (*Printed.*)

No. 58.. Return to an Order of the House of the tenth day of April, 1893, for a Return shewing how often, in the past ten years, the office of Registrar of Deeds for the North and East Ridings of the County of Middlesex has become vacant; the dates when the vacancies occurred and when they were filled, and, if the office is now vacant, how long the vacancy has continued. Presented to the Legislature, 20th April, 1893. Mr. *Meredith.* (*Not printed.*)

No. 59.. Papers and Documents relating to the Kingston, Napanee and Western Railway Company, the Ottawa, Arnprior and Parry Sound Railway Company, the Irondale, Bancroft and Ottawa Railway Company, and the Central Counties Railway Company. Presented to the Legislature, 25th May, 1893. (*Printed.*)

No. 60.. Analysis of Reports of Electoral District and Township Agricultural and Horticultural Societies in Ontario for the year 1892. Presented to the Legislature, 21st April, 1893. (*Not printed.*)

No. 61.. Report of the Master of Titles for the year 1892. Presented to the Legislature, 21st April. 1893. (*Printed*)

No. 62.. Return to an Address to His Honour the Lieutenant-Governor of the 12th day of April, 1893, praying that he will cause to be laid before this House a Return of the timber berths offered for sale at the sale of 13th October, 1892, and of the births then sold, including those sold by private contract after the auction sale, with the area of each berth, the price *per* square mile paid, the names of the several purchasers, the sums received on account of purchase money, the date of the payment thereof and the sums (if any) remaining unpaid on the 1st January, 1893, and shewing whether any, and if so which of the said berths had been previously sold, and when and to whom and for what price, and also for a return of a copy of the advertisement and conditions of sale, and of the Order-in-Council authorizing the sale. Presented to the Legislature, 24th April, 1893. Mr. *Whitney.* (*Printed.*)

No. 63.. Return to an Order of the House of the 4th day of April, 1892, for a Return of copies of all correspondence between the Commissioner of Crown Lands, or any officer of the Department of Crown Lands and George Paget and John Regan, or either of them, on the subject of, or with reference to an action in the High Court of Justice, Queen's Bench Division, between F. J. Jones plaintiff, and James Sharpe, Peter McDermott, George Paget and John Regan defendants, which said action was tried, or partially tried, before the Honourable Mr. Justice Rose at Hamilton, on the 2nd day of October, 1890, and settled by the parties thereto. Giving also, copies of all correspondence between the said Commissioner, or any such officer, and any other person or persons on the subject of or with reference to, the said action. Presented to the Legislature, 24th April, 1893. Mr. *Whitney.* (*Not printed.*)

No. 64.. Return to an Address to His Honour the Lieutenant-Governor of the first day of April, 1892, praying that he will cause to be laid before this House a copy of the Order-in-Council for the appointment of a Commissioner to examine into the claims of the Township of Proton in respect of the Land Improvement Fund, of the Commission used in pursuance thereof, and for a statement in detail of all expenses incurred in respect of the enquiry and report. Presented to the Legislature, 25th April, 1893. Mr. *Meredith.* (*Not printed.*)

No. 65... Copy of an Order-in-Council adopting the first agreement of submission to the Arbitrators appointed for the settlement of the accounts between the Government of the Dominion of Canada and the Governments of the Provinces of Ontario and Quebec, and as between the said Provinces of Ontario and Quebec. Presented to the Legislature, 26th April, 1893. (*Printed.*)

No. 66.. Regulations of the Provincial Board of Health, with respect to Cholera, approved by Order-in-Council, dated 11th April, 1893. Presented to the Legislature, 26th April, 1893. (*Printed.*)

No. 67.. Copy of an Order-in-Council approving of the Regulations respecting the sources of supply and the place of storage of Ice intended for domestic use or cooling purposes, adopted by the Provincial Board of Health. Presented to the Legislature, 26th April, 1893. (*Printed.*)

No. 68.. Return in part, to an Order of the House of the eleventh day of April, 1892, for a Return shewing by Townships the amount remaining unpaid on the

31st December last on lands sold, of (1) Crown Lands, (2) Common School Lands, (3) Grammar School Lands, (4) Railway Lands, and the aggregate amount due in respect of each of the said classes of lands, distinguishing the amounts due for principal and interest respectively. Presented to the Legislature, 26th April, 1893. Mr. *Meredith.* (*Printed*)

No. 69.. Report of the Commissioners for the Queen Victoria Niagara Falls Park. Presented to the Legislature, 28th April, 1893. (*Printed.*)

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No. 70.. Report of the University of Toronto for the year 1891-92, including the Reports of the University and College Councils, together with the Bursar's statement for the year 1892. Presented to the Legislature, 17th May, 1893. (*Printed.*)

No. 71.. Return to an Order of the House of the eleventh day of April, 1892, for a Return shewing the number of bodies received by the Inspector of Anatomy, during each of the past five years from (1) Charitable Institutions (2) Criminal Institutions and (3) all other sources in the Province. Shewing also, the number of persons who have died from natural causes in each of the above named institutions during the same period, and the number of the criminal class who had spent ten years or more in prison before dying in prison, and the number of persons who during the same period have died at the hands of the executioner. Presented to the Legislature, 1st May, 1893. Mr. *Meacham.* (*Printed.*)

No. 72.. Return to an Order of the House of the ninth day of March, 1892, for a Return, shewing the estimated quantity of Pine Timber now standing upon the Crown domain of the Province and the estimated value thereof, setting the same forth as far as practicable by a description, by number or otherwise, of the berths upon which the same is standing, and where the territory has not been divided into timber berths, shewing the localities as far as practicable, and also shewing the data upon which such estimates are based, as far as practicable. Presented to the Legislature, 1st May, 1893. Mr. *Wood* (*Hastings*) (*Printed*)

No. 73.. Report of the Commission on Municipal Taxation. Presented to the Legislature, 5th May, 1893. (*Printed.*)

No. 74.. Return to an Address to His Honour the Lieutenant-Governor of the twelfth day of April, 1893, praying that he will cause to be laid before this House a Return of the names of the several purchasers of the timber berths disposed of at the sale of October, 1890, and of the sales, if any, which were not carried out, and of the amounts, if any, remaining unpaid on account of the purchase money, if any, of such of lots and of a copy of the Order in Council authorizing the sale and of the advertisement and conditions of sale Presented to the Legislature, 4th May, 1893. Mr. *Campbell* (*Algoma.*) (*Printed.*)

No. 75.. Return from the Records of the several Elections to the Legislative Assembly, in the Electoral District of the City of Toronto, of the County of Peel, and the City of Toronto, since the General Election of 1890, shewing:— (1) The number of votes polled for each candidate in each Electoral District in which there was a contest. (2) The majority whereby each successful candidate was returned. (3). The total number of votes polled in each District. (4) The number of votes remaining unpolled. (5) The

number of names on the Voters' List in each District. (6) The population of each District as shewn by the last census. Presented to the Legislature, 22nd May, 1893. (*Printed.*)

No. 76.. Report of the Ontario Game and Fish Commission. Presented to the Legislature, 11th May, 1893. (*Printed.*)

No. 77.. Return to an Order of the House of the third day of May, 1893, for a Return of copies of all correspondence between the License Inspector of North Brant, or other parties, and the License Department, of any member of the Government, in connection with the application of William T. Jenkinson for a tavern license in polling sub division No. 10, Brantford Township. Presented to the Legislature, 8th May, 1893. (Mr. *McCleary.*) (*Not printed.*)

No. 78.. Return to an Order of the House of the nineteenth day of April, 1893, for a Return shewing, separately for each County, the expenditure on colonization, Government, or County Roads and Bridges, by the Crown Lands Department, in the Counties of Victoria, Peterborough, Hastings, Addington and Frontenac during the year 1892, with the location and amount expended on each road and bridge, and giving the name of the overseer in charge, and the amount received by such overseer, for his own services out of each expenditure. Presented to the Legislature, 8th May, 1893. Mr. *Wood* (*Hastings*) (*Printed.*)

No. 79.. Return to an Order of the House of the twenty-third day of March, 1892, for a Return shewing amounts of defalcations made by the Treasurers of any of the Municipalities in the Province of Ontario during the years 1871 to 1891, both inclusive. Shewing also, the amounts any of said municipalities have lost during the same time for want of sufficient sureties being given by said Treasurers, and also shewing the number of Commissions of Enquiry into the finances of municipal corporations issued during said years under Section 383 of the Municipal Act. Presented to the Legislature, 9th May, 1893. Mr. *Balfour.* (*Printed.*)

No. 80.. Return to an order of the House of the nineteenth day of April, 1893, for a Return of copies of all correspondence in connection with an application for a new Bridge over York Branch River, between lots 20 and 21, in the Township of Carlow, in the County of Hastings, during the year 1892, and all papers or memoranda connected therewith. Presented to the Legislature, 10th May, 1893. Mr. *Wood* (*Hastings.*) (*Not printed.*)

No. 81.. Returns of all Fees and Emoluments received by the Registrars of Ontario for the year 1892, under the provisions of R.S.O. 1887. cap. 114, sec. 100, with which are contrasted receipts of the same nature in the years 1890 and 1891. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 82.. Reports of the Poultry and Pet Stock Associations for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 83.. Report of the Bee-Keepers Association for the year 1892. Presented to the Legislature, 12th May, 1891. (*Printed.*)

No. 84.. Report of the Central Farmers' Institute for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 85.. Report of the Bureau of Industries for the year 1892. Presented to the Legislature, 12th May, 1893. (*Printed.*)

No. 86.. Return to an Order of the House of the fifth day of May, 1893, for a Return from the Treasurer of the Medical Council, giving a detailed statement of the sums paid to each member of the Medical Council during the past five years, for travelling expenses and hotel accommodation while attending Council and Committee meetings, and also of the details of the amount not down in the financial returns for 1890, 1891 and 1892, under the heading "Expenses of Legislation." Presented to the Legislature, 12th May, 1893. Mr. *Waters.* (*Printed.*)

No. 87.. Return to an Order of the House of the 10th day of May, 1893, for a Return shewing the number of votes polled in favor of, and against, the Scott Act By-laws when last carried in the different Counties and Cities of this Province. Also, the number of votes polled when the same Counties or Cities repealed such By-laws, and including the vote in those Counties and Cities where the By-laws, under this Act, did not pass. Presented to the Legislature, 16th May, 1893. Mr. *Gibson* (*Huron.*) (*Not printed.*)

No. 88.. Return to an Order of the House of the tenth day of May, 1893, for a Return of all convictions under the Liquor License Act in the Riding of North Ontario during the years 1891 and 1892. Also, of all moneys paid to the License Inspector for salary and expenses during said years, distinguishing the amounts paid for salary and the amounts paid for expenses. Also, of the particulars of any fines which may have been remitted during said years. Also, of the gross amounts of money received by the inspector in his official capacity during said two years, and a detailed statement of the amounts disbursed by him during the same time, shewing to whom and for what such disbursements were made. Presented to the Legislature, 16th May, 1893. Mr. *Glendinning.* (*Not printed.*)

No. 89.. Statement of the amounts loaned to the Municipalities of the Province under the Tile, Stone and Timber Act from 1st January, 1890, to 31st December, 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 90.. Report of the Secretary and Registrar of the Province for the year 1892. Presented to the Legislature, 19th May, 1893. (*Printed.*)

No. 91.. Return to an Order of the House of the fifth day of May, 1893, for a Return of copies of all correspondence between the Government and the License Commissioners of the County of Dufferin, or any other parties, concerning the resignation of the late License Inspector for the County, Mr. Anderson. Also, for copies of all correspondence between the Government and the said License Commissioners, or other parties, concerning the appointment of the present Inspector, Mr. Dodds. Presented to the Legislature, 19th May, 1893. Mr. *Barr* (*Dufferin.*) (*Not printed.*)

No. 92.. Return to an Order of the House of the twenty-fourth day of April, 1893, for a Return giving, except that already brought down, the dates of all Crown Timber Sales from 1871, as follows: The date of sale, the number and extent of the different timber berths in square miles, and the prices obtained at each such sale, *per* square mile. Presented to the Legislature, 22nd May, 1893. Mr. *Preston.* (*Printed.*)

No. 93.. Return to an Order of the House of the nineteenth day of May, 1893, for a Return shewing the number of petitions that have been presented to the House during the present Sessi n asking for a plebiscite on the temperance question from temperance societies, churches and municipal corporations, giving the numbers from each in the order named. Also, shewing the nnmbers fr:m each of the above-named bodies in favor of Provincial or other Prohibition, respectively. And the number of Petitions in favor of Bill (No. 70,) To prohibit the sale of intoxicating liquors by retail. Presented to the Legislature, 23rd May, 1893. Mr. *Field.* (*Printed.*)

ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES

FOR THE

PROVINCE OF ONTARIO

1892

PARTS I, II AND III.—AGRICULTURAL STATISTICS.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

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1893.

ELEVENTH ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES.

PARTS I, II AND III.

To the Honorable Minister of Agriculture:

Sir,—I have the honor to present herewith Parts I, II and III of the eleventh annual report of the Bureau of Industries, being the Agricultural Statistics of Ontario for the year 1892.

I have the honor to be, Sir,

Your obedient servant,

C. C. JAMES,
Secretary.

Toronto, May 12th, 1893.

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ANNUAL REPORT

OF THE

ONTARIO BUREAU OF INDUSTRIES.

PART I.

THE WEATHER AND THE CROPS.

THE WEATHER.

While the general quality or natural condition of the soil has a great deal to do with the character and extent of the crop grown upon it, it is apparent that temperature, sunshine, rainfall in the period of growth (and snowfall in winter) have also much to do in determining the success of operations in field, garden and orchard. Hence it is interesting and instructive to examine records of heat and cold, sunlight and cloud, rain, drouth and snow, as presented in the succeeding tables.

TEMPERATURE. The table following shows the temperature from April to September, inclusive, (the growing season for the bulk of our crops) at ten well-distributed stations, the figures being for 1891 and 1892, together with the average for the eleven years 1882-92 :

Months.		Saugeen.	Birnam	London.	Woodstock	Stony Creek.	Toronto.	Lindsay.	Gravenhurst	Ottawa.	Rockliffe.	Province averages.
		o	o	o	o	o	o	o	o	o	o	o
April.	1892...	38.12	41.45	44.97	41.88	43.14	40.98	39.04	38.16	40.13	35.53	40.34
	1891...	40.50	44.53	47.24	44.81	47.47	43.24	41.93	39.77	42 94	37.30	42.97
	1882-92	38.54	42.16	43.45	41.95	43.17	40.91	39.20	37.77	39.81	36.33	40.33
May	1892...	50.45	52.44	55.23	52.90	52.91	51.35	51.49	51.87	53.05	50.53	52.22
	1891...	48.00	51.61	56.17	52.75	54.99	51.51	52.10	50.65	53.21	48.40	51.94
	1882-92	49.29	53.64	54.96	53.39	53.53	51.84	52.22	51.64	54.83	50.59	52.59
June.....	1892,..	62.33	66.83	69.33	66.91	67.29	65.04	65.20	64.15	64.77	62.53	65.44
	1891...	62 80	65.61	70.38	65.63	66 88	64.34	64.69	64.41	66.48	63.10	65.43
	1882-92	59.98	64.40	65.54	64.77	65.42	62.81	63.26	62.79	65.44	61.14	63.56
July.....	1892...	65.75	68.18	72.80	68.29	70.82	68.11	67.89	67.48	68.49	65.14	68.29
	1891...	61.30	63 44	66.79	63.84	67.70	63.69	62.35	62.73	64.15	61.00	63.70
	1882-92	63.72	67.28	68.57	67.76	70 04	67.20	66.14	66.12	68.33	64.18	66.93
August....	1892...	64.59	66.74	70.32	66.37	69.52	67.36	66.44	66 76	66 49	61.74	66.63
	1891...	63.01	65.70	67.95	65.66	68.08	65.56	64.21	62.57	65.44	59.88	64.81
	1882 92	62.73	65.00	65.82	64.93	68.05	65.49	63 61	63.43	65.45	60.93	64.54
September	1892...	57.29	60.39	61.93	59.12	63.00	60.10	57.32	58.42	57.58	52.42	58.76
	1891...	60.31	62.37	64.46	62.54	64.78	62 49	60 78	60.45	61.55	55.55	61.53
	1882-92	56.70	59.70	59.62	58.72	61.21	58.84	56.50	56.67	57.45	53.22	57.86
Means....	1892...	56.42	59.34	62.43	59.24	61.11	58.82	57.90	57 81	58.42	54.65	58 61
	1891...	55.99	58.88	62.16	59.21	61.65	58.47	57.68	56.76	58.96	54.21	58.40
	1882-92	55.16	58.70	59.66	58.59	60.24	57.85	56.82	56 40	58.55	54.40	57.64

The average temperature of the province was 58.61°, being .21° above that of the corresponding six months of 1891, and .97° higher than the average of the eleven years 1882 92. The average temperatures of the province in both April and May were close to their respective averages for the eleven years, but June, July and August were each much higher than usual—a fact which (together with the remarkable amount of sunshine prevailing in July) had much to do with the rapid ripening of the grain crops, resulting in the "bunching" of haying and harvesting in various sections. September was warmer than its average for the eleven years period, but fell very much short of the unusually hot month of 1891.

SUNSHINE. In the following table the record of sunshine at five stations during the six months April–September, is given for each of the years 1891 and 1892, together with the average for the ten years 1883 92. The figures in the last column represent the hours of possible sunshine, calculated for latitude 45°:

Months.		Woodstock.	Toronto.	Barrie.	Lindsay.	Kingston.	Province average.	Sun above horizon in lat. 45°.
		hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.
April	1892...	175.3	224.8	228.0	234.7	213.1	215.2	406.4
	1891...	186.1	195.3	176.1	210.5	185.3	190.7	
	1883-92	190.1	198.9	173.3	208.9	195.6	193.4	
May	1892...	143.1	162.9	160.1	180.2	180 7	165.4	461.1
	1891..	245.4	236.0	213.8	227.4	225.2	229 6	
	1883-92	201.1	216.7	193.4	215.5	213.3	208.0	
June	1892...	216 6	217.5	142.0	203.8	227.2	201.4	465.7
	1891	247.3	242.4	234 4	271.7	231.6	245.5	
	1883-92	238.0	257.2	218.6	253.4	241.7	241.8	
July	1892...	321.2	313.5	302.3	329.7	308.6	315 1	470.9
	1891...	275.7	247.7	231.0	242.4	249.2	249.2	
	1883-92	273.7	287.9	258.0	282.0	271.3	274.6	
August	1892...	239.2	234.2	217.7	224.9	242.0	231.6	434.5
	1891...	222.0	220.5	205.9	207.6	230.7	217.3	
	1883-92	230.6	248.9	214.2	255.8	245.8	239.0	
September	1892...	178.5	248.0	215.6	232.1	216 6	218.2	376.3
	1891...	231.0	251.7	220.3	237.6	214.5	231.0	
	1883-92	199.4	219.3	158.4	210.6	202.1	198.0	
Totals	1892...	1273.9	1400.9	1265.7	1405.4	1388.2	1346.9	2614.9
	1891...	1407.5	1393.6	1281.5	1397.2	1336.5	1363.3	
	1883-92	1332.9	1428.9	1215.9	1426.2	1369.8	1354.8	

Taking the average of the province for the six months, less hours of sunshine were registered than usual, there being only 1,346.9 out of the possible 2,614.9, compared with 1,363.3 hours in 1891, and an average of 1,354.8 for the ten years 1883-92. April opened the season as a comparatively bright month, but May and June were cloudy and dull. The harvest months of July and August experienced an unusual amount of sunshine, the remarkable record of 315.1 out of a possible 470.9 hours being accredited to the former. September was also a bright month compared with its average, although it did not equal the number of hours registered in the previous year.

PRECIPITATION. The fall of rain and snow by districts during what may be considered the five winter months is presented in the following table for each of the years 1891 and 1892, together with the average for the eleven years 1882-92 :

Months.		West and southwest		Northwest and north		Centre.		East and northeast		Province average.	
		Rain.	Snow.	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.
		inches	inches	inches	inches	inches	inches	inches	inches	inches	inches
November ..	1891...	4.47	8.2	4.40	11.5	3 84	5.0	2.93	4.9	3 91	7.4
	1890...	2.92	2.9	1.73	6.5	3.38	3 0	1 82	4.9	2.46	4 3
	1882-91	2.63	6.4	2.28	13.6	2.46	5.4	2.05	8.7	2.35	8.5
December ..	1891...	2.21	4.0	1.18	9.1	2.07	7.1	1.92	5.4	1.84	6.4
	1890...	0.31	25.1	0.84	25.7	0.13	15.2	0.11	14.2	0.35	20.1
	1882-91	1.50	14.3	1.20	21.0	1.44	11.6	1.12	13.8	1.32	15.2
January	1892...	0.38	21.7	0.79	23.2	0.19	21.7	0.40	20.0	0.44	21.7
	1891 ..	1.59	8.0	0 93	16.4	1 84	13 2	1.11	18.1	1.37	13 9
	1882-92	1.31	16.4	1.06	28.0	1.28	18.3	1.00	21.8	1.16	21.1
February....	1892...	1 66	10.2	0.14	17.5	0.77	17.3	0.06	22 0	0.66	16.7
	1891. .	2.73	6.2	1.28	18.4	1 72	12.9	1.35	15.5	1.77	13.3
	1882-92	1.78	10.7	0.73	21.6	1.32	12.4	0.82	18.8	1.16	15.9
March.....	1892...	0.81	5.3	0.18	8.9	0.66	5.6	0.35	11 0	0.50	7.7
	1891.	1.48	13.4	0.50	24.8	1.43	17.7	2.44	23.1	1.46	19 7
	1882-92	1.23	10.5	0.76	14.9	1.08	10.3	0.95	14.7	1.01	12 6
Totals....	1892...	9.53	49.4	6.69	70.2	7.53	56.7	5.66	63 3	7.35	59 9
	1891...	9.03	55.6	5.28	91.8	8.50	62.0	6.83	75.8	7.41	71.3
	1882-92	8.45	58.3	6.03	99.1	7.58	58.0	5.94	77.8	7 00	73.3

In examining the foregoing table it is well to bear in mind that an inch of rain is the equivalent of ten inches of snow, although of course, snow in winter is considered more timely and beneficial than rain. It will be seen that the 7.35 inches of rain falling during the five months were .35 inch greater than the average of the eleven years. The precipitation of snow however was quite small, only 59.9 inches being recorded, as against an average of 73.3 inches for the eleven years.

Of much greater importance, however, is the extent of rainfall or drouth during the growing season. The next table gives the precipitation for the six months, April-Sept., and the total for the season, as well as the average for the eleven years 1882-92 :

Month.	West and southwest.		Northwest and north.		Centre.		East and northeast.		Province average.	
	1892.	1882-92.	1892.	1882-92.	1892.	1882-92.	1892.	1882-92.	1892.	1882-92.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
April.....	1.60	1.70	1 12	1.42	0.94	1.54	0.92	1.36	1.15	1.50
May	5.82	3.40	2.65	2.46	3.50	2.61	2.60	2.43	3.64	2.72
June	5.56	3.49	3.76	2 82	4.67	3.23	4.17	2.89	4.54	3.11
July	2.54	2.57	3.20	2.67	3.11	2.42	2.08	2.93	2.73	2.65
August....	3.23	2.83	4.73	2.92	3.61	2.60	5.45	2.97	4.26	2.83
September.	4.21	2.50	4.50	3.05	3.26	2.46	3.40	2.54	3.84	2.64
Totals...	22.96	16.49	19.96	15.34	19.09	14.86	18.62	15.12	20.16	15.45

April had a light rainfall compared with its average for the eleven years, but the other five months were unusually wet, more particularly June, August and September, the result being that the total precipitation in the six months amounted to 20.16 inches as against an average of 15.45 inches for the same months in the eleven years.

Abstract of the results of meteorological Observations at Little Forks (Rainy Lake) during the year 1892.

Months.	Temperature.							Mean temperature of dew point.	Mean relative humidity.	Mean amount of sky clouded.	Mean force of wind.	Winds from								Rain.		Snow.		No. of fogs.	No. of thunder storms.
	Mean.	Highest.	Lowest.	Mean daily range.	Greatest daily range.	Mean temperature of warmest day.	Mean temperature of coldest day.					North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Amount.	Days.	Amount.	Days.		
	o	o	o	o	o	o	o			0-10	0-10										in.		in.			
January	-1.39	37.0	-41.0	16.4	34.0	30.2	-36.3	....	87	3	2	34	1	4	4	14	5	20	11	....	....	....	9.9	4	....	....
February	6.77	32 0	-45.0	23.9	59.0	24.0	-23.8	....	88	3	2	31	3	....	....	9	17	18	9	....	.....	....	7.0	7	....	....
March	16.10	60.0	-24.5	25.7	36 1	46.3	-10.3	....	88	4	2	23	5	10	6	20	21	4	4	....	.....	....	7.0	3	....	....
April	33.14	62 0	- 6.5	22.8	37.4	41.9	10.5	....	93	4	2	47	13	5	1	2	8	12	2	....	7.00	5	14.0	6	....	....
May	44.44	68.0	29.0	18.8	34.0	53.8	34.0	....	93	5	2	26	1	3	5	15	5	24	14	....	6.10	7	15.0	2	....	....
June	57.85	86.0	32.0	32.9	48.0	64.3	43.5	55.0	84	2	2	10	....	....	2	18	22	33	5	....	5.60	5	...	....	....	2
July	62 62	96 0	35.0	39 7	53.5	70.8	49.2	60.5	84	3	2	27	....	1	1	13	19	22	10	....	6.20	8	...	....	....	7
August	53.37	92 0	27.0	37.7	55.0	63 3	40.6	53.0	89	5	2	10	....	....	3	17	28	18	17	..	9.35	17	....	....	....	12
September	53.12	88.0	30.0	25.9	42 0	68.5	39.1	51.5	89	5	2	7	....	....	4	27	22	19	11	....	1.93	6	....	....	....	2
October	50.17	86.7	20.7	27.7	41.2	68.1	27.5	49.5	89	4	2	7	....	....	....	18	23	33	12	....	0.16	3	s	1	....	....
November	15.46	38.0	-28.5	20.4	42.5	31.3	-17.0	....	90	5	2	48	1	1	....	7	6	13	14	....	0.02	1	6.1	5	....	....
December	-2.21	31.0	-42.0	22 8	50.0	28.4	-28.5	....	83	4	1	51	....	...	...	10	10	11	11	....	...	....	5.0	9	....	...
1892	32.45	96.0 July 11	-45.0 Feb. 18	26.23	59.0	70.8 July 21	-36.3 Jan. 14	....	88	4	2	321	24	24	26	170	186	227	120	....	36.36	52	64.0	37	....	23
1891	36.23	97.7 Aug 5	-32.5 Feb. 28	22.75	52 7	79.1 Aug. 5	-20.8 Feb. 2	....	89	4	2	164	31	42	53	190	204	249	162	....	48.25	69	55.9	48	2	15

FARM LANDS OF THE PROVINCE.

RURAL AREA ASSESSED. The table below gives the acreage assessed in townships which are municipally organized by county groups, the total for the province being given for all classes of land for 1891 and 1892.

Districts.	Acres assessed.			Acres cleared.		Acres woodland.	Acres swamp, marsh or waste.	Per cent. cleared.
	Resident.	Non-Resident.	Total.	1892.	1891.			
Lake Erie.....	2,285,991	50,383	2,336,374	1,445,756	1,411,160	795,303	95,315	61.9
Lake Huron.	2,235,004	60,843	2,295,847	1,374,372	1,353,225	652,964	268,511	59.9
Georgian Bay.....	1,955,180	68,712	2,023,892	1,083,570	1,065,043	693,314	247,008	53.5
West Midland....	3,225,462	29,707	3,255,169	2,340,885	2,315,034	608,073	306,211	71.9
Lake Ontario.....	3,001,840	45,329	3,047,169	2,325,886	2,306,834	470,385	250,898	76.3
St. Law. & Ottawa	5,085,099	225,841	5,310,940	2,374,037	2,342,351	2,116,436	820,467	44.7
East Midland.....	2,530,173	138,760	2,668,933	867,907	843,948	1,404,175	396,851	32.5
Northern Districts	1,433,021	275,289	1,708,310	176,013	164,892	1,288,691	243,606	10.3
The Province .. 1892	21,751,770	894,864	22,646,634	11,988,426	....	8,029,341	2,628,867	52.9
The Province .. 1891	21,589,562	946,421	22,535,983	....	11,802,487	8,376,762	2,356,734	52.4

The total rural area assessed in 1892 was 22,646,634 acres, or 110,651 acres more than in 1891, although a decrease of 51,557 acres is observable in the area of non-resident land. There is an increase in the acreage of cleared land of 185,939 acres, and the percentage of cleared land to the total area assessed now reaches 52.9, being an increase of .5 over that of the preceding year.

AREA IN PASTURE. The following table shows the number of acres in pasture by county groups and for the province in each of the five years 1888-92, and also the percentage of cleared land in pasture in 1892 :

Year.	Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Law'nce and Ottawa.	East Midland.	Northern Districts.	The Province.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
1892.....	238,565	350,067	222,766	504,588	360,243	673,231	184,389	28,191	2,562,040
1891.....	269,189	381,578	234,623	530,858	379,627	693,923	201,289	30,194	2,721,281
1890....	246,107	339,984	214,561	513,612	369,063	641,597	195,303	21,865	2,542,092
1889.....	249,623	319,428	221,087	511,618	410,416	685,401	191,194	19,195	2,607,962
1888.....	239,330	307,879	213,925	504,840	406,620	665,139	179,823	18,048	2,535,604
Per cent. of cleared land in 1892	16.5	25.5	20.6	21.6	15.5	28.4	21.2	16.0	21.4

A decrease in the number of acres of pasture is to be seen in every group, the result being that the total area in pasture is but 2,562,040 acres, or 159,241 less than in the previous year. The heaviest falling off is noticed in the Lake Erie and Lake Huron districts. Of the cleared land of the province 21.4 per cent. is in pasture. In the dairying counties comprising the St. Lawrence and Ottawa group, the percentage runs as high as 28.4, while in the Lake Ontario group it reaches only 15.5.

ACREAGE IN CROPS. The subjoined table gives the number of acres under staple field crops for each of the five years 1888 92, together with the average for the eleven years 1882-92 :

Field crops.	1892.	1891.	1890.	1889.	1888.	1882-92
	acres.	acres.	acres.	acres.	acres.	acres.
Fall wheat	966,522	849,956	720,101	822,115	826,537	908,636
Spring wheat	651,302	510,634	601,753	398,610	367,850	571,525
Barley	499,225	553,166	701,326	875,286	895,432	721,062
Oats	1,861,469	1,840,636	1,882,366	1,923,444	1,849,8 8	1,681,229
Rye	73,073	67,865	103,061	90,106	84,087	100,857
Peas	774,732	752,453	781,206	708,068	696,653	678,578
Corn ..... Husking	181,463	241,086	223,836	187,116	222,971	202,877
Corn ..... Fodder	91,403					
Buckwheat	125,104	107,879	90,111	56,398	57,528	74,309
Beans	33,249	41,451	39,456	21,830	22,700	26,841
Potatoes	145,703	160,218	158,094	145,812	153,915	154,563
Mangel-wurzels	22,026	22,961	25,953	21,211	21,459	19,772
Carrots	9,941	9,858	11,977	11,261	11,524	10,379
Turnips	129,627	126,075	111,055	111,103	113,188	107,187
Hay and clover	2,515,367	2,549,975	2,462,002	2,386,223	2,292,638	2,310,938
Total	8,080,206	7,834,213	7,912,297	7,758,583	7,616,350	7,568,753

The total area in field crops reaches 8,080,206 acres, which is 145,993 acres more than in the previous year, and the largest area of any year in the table. There is a marked increase in the area of both fall and spring wheat, and oats, peas, corn, buckwheat carrots and turnips also show increased acreages. The area given to barley is still contracting, and is now but little more than half that of 1888 ; while rye, beans, potatoes and mangels have each a smaller acreage than in 1891. Barley, rye, potatoes and carrots are the only crops which do not equal their respective averages for the eleven years 1882 92.

The following table presents the acreage by county groups and for the province, and for the same periods, of all the crops mentioned in the preceding table :

Year.	Lake Erie.	Lake Huron	Georgian Bay.	West Midland.	Lake Ontario.	St. Law'ce and Ottawa.	East Midland.	Northern Districts.	The Province.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
1892....	1,0 02,829	869,630	733,539	1,542,550	1,696,482	1,503,724	593,111	138,341	8,080,206
1891....	990,197	844,278	696,561	1,504,482	1,635,753	1,463,449	571,755	127,738	7,834,213
1890....	996,955	851,934	696,361	1,539,165	1,669,314	1,474,437	569,117	115,014	7,912,297
1889....	949,859	812,757	719,473	1,481,308	1,667,961	1,450,920	582,343	93,962	7,758,583
1888....	958,486	801,218	690,243	1,489,263	1,635,315	1,402,502	551,102	88,221	7,616,350
Average 1882-92	940,050	794,590	674,989	1,471,688	1,624,007	1,497,448	561,313	94,668	7,568,753

An increase is noticed in the figures in every group compared with those of the previous year, and every group also exceeds its own average for the eleven years' period.

PROPORTIONAL AREAS UNDER CROP. The table following shows the relative distribution of the various crops per 1,000 acres cleared, by county groups and for the province, in 1891 and 1892, together with the average for the eleven years 1882-92:

Districts.		Fall wheat.	Spring Wheat.	Barley.	Oats.	Rye.	Peas.	Corn.	Buckwheat.	Beans.	Hay and Clover.	Potatoes.	Mangel-wurzels.	Carrots.	Turnips.	Total.
Lake Erie	1892	188.5	8.5	29.1	123.9	7.8	41.1	68.7	10.5	17.6	192.7	10.3	1.2	.6	2.1	693.6
	1891	163.9	9.5	23.9	122.1	5.4	46.7	71.6	9.9	23.2	211.4	10.3	1.3	.6	1.9	701.7
	'82-92	171.7	9.5	28.5	126.8	8.7	46.6	72.1	8.3	14.2	209.3	12.0	1.1	.6	1.7	711.1
Lake Huron	1892	107.2	32.6	27.5	149.7	1.0	68.9	12.4	1.9	.5	207.9	8.7	2.0	.6	11.8	632.7
	1891	97.6	21.7	33.7	154.9	.8	72.7	11.3	1.4	.8	205.1	9.9	2.1	.7	11.2	623.9
	'82-92	118.2	29.7	47.4	151.3	.8	68.1	9.2	1.1	.5	197.2	10.4	2.0	.8	10.7	647.4
Georgian Bay	1892	71.7	60.9	41.5	169.4	1.3	87.8	6.0	2.9	.2	206.1	12.6	.8	.9	14.9	677.0
	1891	69.5	51.1	37.7	167.1	2.2	85.6	2.9	1.5	.3	206.2	14.0	.8	.8	14.3	654.0
	'82-92	79.7	73.0	52.0	159.1	2.8	81.1	2.1	1.0	.3	197.8	13.9	1.0	1.1	13.0	677.9
West Midland	1892	110.5	41.7	41.1	159.4	2.4	66.2	16.1	1.5	.4	188.6	10.2	2.9	.7	17.3	659.0
	1891	98.4	29.7	49.5	167.3	1.2	67.0	14.4	1.2	.3	188.3	11.6	3.6	.8	16.6	649.9
	'82-92	114.7	35.9	58.2	156.9	2.2	62.9	13.4	1.1	.5	186.9	12.0	2.9	1.0	16.1	664.7
Lake Ontario	1892	77.1	84.1	79.1	136.1	9.2	85.4	19.7	20.9	.8	185.2	12.6	2.5	.9	15.8	729.4
	1891	65.2	70.0	88.3	140.4	9.2	77.8	15.7	15.1	.8	192.9	14.5	2.1	.8	16.3	709.1
	'82-92	71.4	74.7	122.7	129.7	13.6	70.2	14.2	9.4	1.0	182.8	14.0	2.3	1.2	13.6	720.8
St. Lawrence & Ottawa	1892	4.0	56.5	24.6	185.4	7.7	38.9	21.9	15.0	1.3	258.7	15.4	.9	.9	2.2	633.4
	1891	5.2	45.1	28.0	175.0	9.1	38.7	17.3	15.7	1.8	267.6	17.1	.9	.9	2.4	624.8
	'82-92	7.0	53.6	40.7	177.1	14.4	42.0	11.0	13.3	1.5	256.8	17.5	.8	.7	1.9	638.3
East Midland	1892	24.1	105.8	52.8	150.3	14.5	73.7	16.1	17.7	1.1	200.6	13.0	2.4	1.1	10.2	683.4
	1891	25.8	83.4	56.1	155.0	12.9	67.1	12.9	17.6	.7	218.4	14.9	2.2	1.0	9.5	677.5
	'82 92	32.6	93.3	94.9	147.0	21.6	65.5	10.1	9.1	.7	195.7	15.2	1.7	1.0	7.6	696.0
Northern Districts	1892	4.0	51.4	16.4	185.5	5.6	88.9	3.2	6.1	.9	382.2	23.6	.5	1.9	15.8	786.0
	1891	3.6	41.0	14.9	175.9	4.9	91.9	3.2	8.0	.9	379.2	27.3	.4	1.7	21.8	774.7
	'82-92	4.6	69.6	15.8	167.6	7.5	76.5	3.0	5.2	.7	366.6	25.5	.7	1.3	18.3	762.9
The Province	1892	80.6	54 3	41.7	155.3	6.1	64.6	22.8	10.4	2.8	209.8	12.2	1.8	.8	10.8	674.0
	1891	72 0	43.3	46.9	156.0	5.7	63.8	20.4	9.1	3.5	216.1	13.6	1.9	.8	10.7	663.8
	'82-92	81.5	51.3	64.7	150.8	9.0	60.9	18.2	6.7	2.4	207.3	13.8	1.8	.9	9.6	678.9

The total for the province shows that out of every 1,000 acres cleared 674 are under the crops given in the table. This shows an increase of 10 2 acres per 1,000 over the previous year, although 4.9 acres below the average for the eleven years. The Northern Districts have the largest proportional area under cultivation, namely, 786 acres per 1,000 cleared, while of the older and more settled groups the Lake Ontario counties make the best showing with 729.4 acres per 1,000. The Lake Erie district is the only group which failed to reach its figures for 1891. That group however has the largest proportional area under fall wheat, corn and beans. The beefing counties of the West Midland group have the greatest ratio in mangels and turnips, the Lake Ontario district lead in spring wheat, barley and buckwheat, while the East Midland has the largest proportion of rye. The Northern Districts has the highest proportional area for the following crops: Oats (the St. Lawrence and Ottawa group coming within .1 of it), peas, hay and clover, potatoes and carrots.

FALL WHEAT.

The bulletin sent out in November, 1891, had the following concerning the growing crop of fall wheat: "The acreage of fall wheat sown in 1891 is at least 15 per cent. greater than that sown in 1890 (the actual figures make it nearly 14 per cent.), the increase being entirely in the western part of the province. The reasons assigned by correspondents for this increase are the following: The extraordinarily fine results of the crop this year, the low price of barley the past summer, and the very favorable weather of September for sowing Most of the land which had been specially prepared for fall wheat was in good condition, but a great deal of land has been put down to this crop that is dirty and poorly prepared as a consequence of the increased acerage On the whole the condition of the land at sowing may be termed 'fair.' Sowing commenced in the latter part of August and continued up to the end of October, but most of it was done from the 5th to the 20th of September. The early sown made rapid growth, became too rank if anything, and in many sections now shows very yellow and appears in very poor form. The late sown came up very slowly and unevenly owing to the dry weather. The general condition at present is hardly equal to that reported in 1890. Wire-worm and rust are reported from a few sections, but not enough as yet to cause any alarm. The reports of Hessian fly are far more numerous, but in all cases the reason assigned is the yellowing of the crop which may be due to other causes. No one reports any direct evidence of the presence of the fly, and many reports are worded thus: 'Early sown is yellowing, supposed to be due to the Hessian fly, but have not been able to find any.' The varieties principally sown are the following: Clawson—the favorite of the province—Democrat and Manchester in many districts, Hybrid-Mediterranean and Surprise in one or two districts, and small sowings of Canadian Velvet Chaff all over the west. A great many new varieties are being tested."

The bulletin issued in April, 1892, contained the following reference to the crop: "The past winter has proved a very favorable one for fall wheat, and the crop—particularly the early sown—presented an exceptionally promising appearance when spring opened. Being protected by a sufficient depth of snow, it suffered but slightly from winter killing. The snow left very rapidly, and fair growth was made until about the end of the first week in April, when the fields looked at their best. Frosty nights, sunny days and cold winds then followed, so that at the time of writing the weather was particularly detrimental to growth, and it is reported that on this account the young crop has received a noticeable set-back and now presents a somewhat browned appearance. The fear of a continuance of such conditions was causing some anxiety, and warm, moist weather was earnestly looked for, as with its advent, if not too long delayed, the crop will doubtless quickly recover itself. As regards the condition of the crop on various soils—although there is much uniformity—it is looking particularly well on light, warm loams and well drained clays and clay loams. On black mould and on low-lying wet lands it has suffered to some extent from frost. The damage from insects, etc., appears to have been inconsiderable. The Hessian fly did slight injury in some localities on early sown fields, as did also the wire-worm on recently-broken pasture lands. Practically the only unfavorable reports as to the condition of the crop come from the county of Essex and vicinity, where, on account of local drouth, the crop did not start the winter in very satisfactory shape. Excepting in this locality, the present indications are that very little winter wheat will be plowed up, and provided the critical time between now and the middle of May is successfully passed, the prospects for a good crop are promising."

The June bulletin presented fall wheat under a rather favorable aspect. It said: "This crop is still in a very promising condition, very little has been plowed up and the only unfavorable conditions are noted in connection with late-sown grain and that put in upon low lying undrained lands. The diverse conditions of climate of this Province are shown by two reports—one stating that fall wheat was heading out, another that spring seeding had just fairly commenced. The greatest loss appears to have fallen on the extra acreage of last fall which was hastily put in on poorly-prepared land. The principal fall wheat counties report as follows: Essex and Kent, suffered most from drouth and frost in April and rains in May, some plowed up, only two-thirds of an average crop promised;

Elgin, fair; Norfolk and Haldimand first-class, especially where properly put in; Welland, fair; Lambton affected by heavy rains, two-thirds of a crop; Huron, Bruce and Grey, early sown good, late sown poor, crop late, prospects above average; Simcoe, never better except on low lands; Middlesex, crops affected by weather and are backward, prospects fair for good crop; Oxford, Brant and Perth, prospects very good except on low lands; Wellington, Waterloo and Dufferin, prospects good, crops a little backward; Lincoln, very fine: Wentworth, good, except on low land, straw rank; Halton and Peel, very good; York, to Prince Edward, good. On the whole, present conditions point to a first-class crop of fall wheat, warm weather however being very desirable and necessary, as a very rapid growth of straw has taken place and a continuance of wet weather would cause great loss from drowning-out and from lodging. An extra good crop may be expected should bright warm weather continue."

August reports were not so encouraging as those made earlier in the season, as will be seen by the following from the bulletin issued in that month: "Some wheat was cut in Essex as early as July 4th, but the harvest in general extended from the middle of July to the end of the first week of August; in the north it was even later, but the busy season was from July 15th to July 30th. The heavy rains of June and many severe wind storms lodged a great deal of the grain, rust was thereby encouraged in all the principal wheat counties. Then came a very hot July which ripened the grain a little too rapidly—the result is that much of the grain is shrunken and light and the yield will not be so large as expected. In the east, where grown, the quality is reported very good. The straw is a good yield; the yield of grain is reported good, but the quality only fair. On the whole the fall wheat will not turn out nearly so good a crop as that of last year."

In the November bulletin fall wheat was characterized as one of the most successful crops of the year. The following table gives the acreage and yield by county groups and for the province for 1891 and 1892, together with the average for the eleven years 1882-92:

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Lake Erie	272,537	5,071,262	18.6	231,292	5,940,500	25.7	227,034	4,342,723	19.1
Lake Huron	147,345	3,087,012	21.0	132,096	3,536,347	26.8	145,055	2,914,114	20.1
Georgian Bay	77,702	1,721,786	22.2	73,973	1,839,186	24.9	79,433	1,651,459	20.8
West Midland	258,618	6,082,323	23.5	227,652	6,405,516	28.1	253,939	5,272,061	20.8
Lake Ontario	179,337	3,906,047	21.8	150,465	3,515,869	23.4	160,834	3,297,719	20 5
St. Lawrence and Ottawa	9,371	207,601	22.2	12,195	214,109	17.6	15,496	280,579	18.1
East Midland	20,904	398,547	19.1	21,753	407,012	18.7	26,273	510,275	19.4
Northern Districts	708	17,919	25.3	600	13,949	23.2	572	11,510	20.1
Totals	966,522	20,492,497	21 2	849,956	21,872,488	25.7	908,636	18,280,440	20.1

The area of fall wheat in the province now reaches 966,522 acres, there being an increase of 116,566 acres over that of 1891. The St. Lawrence and Ottawa and East Midland districts do not share in the general increase, but the acreage of fall wheat in these two groups is at the best inconsiderable. The average yield per acre for the province is 21 2 bushels, being 4 5 bushels lower than the unusually large average yield of the preceding year, but 1.1 bushel more than the average for the eleven years. The total yield is 20,492,497 bushels, which is 1,379,991 bushels less than in the previous year, but exceeds the average for the eleven years by 2,212,057 bushels.

The New Crop of Fall Wheat. Owing to the protracted harvesting of the spring-sown crops and varying conditions of weather, sowing of the new fall wheat crop was spread over a larger period of time than usual. Most of the sowing was done

September 1st to 15th. The early sown looks better than the late sown. Although the growth has not been as heavy as might be desired, on the whole the condition is very good. Very little damage has been observed from any source. While it is difficult to accurately estimate the acreage, the reports indicate about the same acreage sown as last year; there may be a slight decrease.

SPRING WHEAT.

Correspondents in April had little or nothing to say regarding the sowing of spring wheat. The June bulletin had the following regarding the crop: "The Lake Erie counties report much damage from rain in the west, with improvement in condition as we come east; yet even in that section at present it is only fair. Lambton and Huron report a backward growth and much loss through rain; Bruce, Grey and Simcoe on the whole give most satisfactory returns, some parts being affected by too much rain and the growth being a little backward. The prospects in the West Midland counties are good, as also they are from Lincoln to Prince Edward county. The eastern and northern sections report spring wheat in very good condition, except on low land. While the spring wheat can, on the whole, be considered in hardly as good condition as the fall wheat, the present prospects are up to the average, but success is now dependent upon continued warm weather."

The August bulletin told the following story regarding the crop: "Harvesting was in progress on August 10th over almost the entire Province. The general condition of spring wheat is reported to be not so good as that of fall wheat. What little is grown in the west is light and much of it rusted. The Lake Ontario and eastern counties report a fair crop in volume, but under the average in quality, the most favorable reports being from Lennox, Hastings, Victoria, Lanark, Leeds, Dundas and Stormont. At present in Muskoka and the other northern sections the general appearance is very promising. Taking the Province as a whole the straw is a good crop, and the grain is in good quantity but lighter than usual. Rust is reported from nearly every county; the midge from Halton, Peel and York, and the Hessian fly also has done some damage."

The November reports were not cheering regarding the yield of spring wheat. The bulletin issued in that month declared that the crop had turned out very poor, and the complaints of comparative failures were general.

The appended table gives by county groups and for the province the acreage and yield for 1891 and 1892, and also the average for the eleven years 1882-92:

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.
Lake Erie	12,322	126,898	10.3	13,411	221,758	16.5	12,502	180,078	14.4
Lake Huron	44,773	598,496	13.4	29,413	610,312	20.7	36,413	520,276	14.3
Georgian Bay	66,017	808,670	12.2	54,568	1,071,181	19.6	72,659	1,064,624	14.7
West Midland	97,642	1,264,339	12.9	68,786	1,514,049	22.0	79,489	1,205,001	15.2
Lake Ontario	195,494	2,103,090	10.8	161,574	3,356,283	20 8	168,402	2,655,098	15.8
St. Lawrence and Ottawa	134,211	2,265,243	16.9	105,704	2,494,112	23.6	118,214	1,974,192	16.7
East Midland	91,792	985,404	10.7	70,409	1,307,802	18.6	75,213	1,075,822	14.3
Northern Districts	9,051	138,255	15.3	6,769	136,041	20.1	8,633	154,034	17.8
Totals	651,302	8,290,395	12.7	510,634	10,711,538	21.0	571,525	8,829,125	15.4

The area of spring wheat in the province was 651,302 acres, which is 140,168 acres of an increase over that of the previous year. Nevertheless the exceeding low yield per acre has caused the total yield to fall far below that of 1891; and indeed to go below the average for the eleven years. The average yield per acre of the province was only 12.7 bushels per acre, compared with 21.0 in the preceding year, and an average of 15.4

bushels for the eleven years. The Lake Erie counties had the lowest average yield per acre, and was the only group which had a smaller area than in 1891. The best average yield per acre was experienced in the St. Lawrence and Ottawa group.

BARLEY.

This cereal has always commanded particular attention in Ontario, and of late years additional interest has been lent to its culture, owing to the enactment of the McKinley Bill, and the introduction of the two-rowed barley with a view to gaining an entrance to the British market. It can hardly be said that the prospects of barley growing are encouraging. The June bulletin said: "The acreage is still decreasing, Essex, Kent, Lambton and Middlesex appear to have suffered most from rain and frost. There is an improvement in condition along Lake Erie in going east, and Bruce and Huron give better reports than the counties to the south. As to the rest of the western section the general report is that the high lands look very promising, the low lands very poor. From Lincoln to the eastern boundary of the province, the returns are quite favorable. The inland and northern regions report backward growth, favorable only on well-drained soils. The present condition of barley over the province is fair but backward, with the prospect of a very much decreased total yield unless the weather soon becomes and continues more favorable."

That important factor, color, is reported upon in the August bulletin as follow: "The excessive rain of June caused a rapid and rank growth of straw, the storms lodged a good deal, and as a consequence the larger portion of the barley is this year discolored. It ripened too rapidly under the heat of July and August and the grain is not perfectly filled The best reports as to two-rowed barley come from the east. Many correspondents think the season has been even more unfavorable for two rowed than for six-rowed. The quantity of barley available and suitable for export for malting will probably be very limited, and much less than in former years."

The November bulletin spoke briefly and discouragingly of the crop as follows: "Barley is under the average in yield, and the quality on the whole is not first-class It has been a poor season for two-rowed barley, and very little has been said in its favor."

The following table shows the acreage and yield by county groups and for the province for 1891 and 1892, together with the average for the eleven years 1882-92:

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.
Lake Erie	29,081	649,488	22.3	33,771	856,901	25.4	37,657	921,908	24.5
Lake Huron	37,801	936,046	24.8	45,633	1,325 143	29.0	58,227	1,550,310	26.6
Georgian Bay	44,966	1,172,530	26.1	40,124	1,183,350	29.5	51,772	1,325,524	25.6
West Midland	96,251	2,529,277	26.3	114,653	3,543,512	30.9	128,822	3,653,671	28 4
Lake Ontario	183,978	4,553,022	24.7	203,705	5,859,191	28 8	276,425	7,195,020	26.0
St. Lawrence and Ottawa	58,393	1,293,049	22.1	65,491	1,970,465	30.1	89,654	2,172,038	24.2
East Midland	45,875	1,069,877	23.3	47,333	1,341,597	28.3	76,549	1,841,163	24.1
Northern Districts	2,880	71,029	24.7	2,456	61,745	25.1	1,956	46,532	23.8
Totals	499,225	12,274,318	24.6	553,166	16,141,901	29.2	721,062	18,706,166	25.9

The area of barley grown in the province was 499,225 acres, as against 553,116 acres in the preceding year, and 895,432 in 1888. An increased acreage as compared with 1891 is noticed in the Georgian Bay group and the Northern Districts. The average yield per acre for the province is 24.6 bushels, which is less by 4.6 bushels than the average for the previous year, and 1.3 bushel less than the average for the eleven years. The West Midland counties are credited with the best average yields for the three periods comprising the table.

OATS.

This crop suffered much from the rains prevailing in the early part of the summer. The June bulletin thus described the growing crop: "As with barley, the greatest loss has occurred in the southwestern portion of the province, many reporting at least one-third of the crop in that section destroyed by water. The condition improves as we go east and northeast. The central, eastern and northern sections report a large acreage doing exceedingly well on high land and poorly on low land, the growth however being much retarded. On the whole the condition of oats is better than that of barley, and should the weather be favorable for the next few weeks a more than average crop may be expected."

The August bulletin was encouraging in tone when referring to the oat crop. It remarked: "As was stated in our last bulletin the early rains drowned out a considerable portion of the crop in low-lying and poorly drained land. The oats that survived those rains have come on in fine condition and are to-day very promising, although not up to the very high yield of 1891. The harvest in the west will be a little late owing to rain and lodging—it will be in full operation between the 15th and 20th of August. The most promising reports come from the Lake Ontario, St. Lawrence and Ottawa and the East Midland counties. The Northern Districts promise well, but it is too early yet to make very definite estimates. A few reports of rust and of poor yield through being blown down are to hand, but on the whole the crop is one of the most promising of those on our list." The table following gives by county groups and for the province the acreage and yield for 1891 and 1892, together with the average for the eleven years 1882-92:

Districts.	1892.			1891.			Yearly average for the eleven years 1882 92.		
	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.
Lake Erie	179,183	5,525,918	30 8	172,276	6,570,071	38.1	167,586	5,908,429	35 3
Lake Huron	205,681	7,482,859	36 4	209,600	8,462,066	40.4	185,684	6,593,416	35.5
Georgian Bay	183,583	6,687,382	36.4	177,988	6,777,596	38.1	158,458	5,312,667	33 5
West Midland	373,111	14,064,563	37.7	387,307	17,075,815	44.1	347,387	13,267,681	38.2
Lake Ontario	316,658	11,625,133	36.7	323,775	13,700,031	42.3	292,328	10,710,389	36.6
St. Lawrence and Ottawa	440,184	14,104,168	32 0	409,849	16,804,660	41.0	390,443	12,790,506	32.8
East Midland	130,418	4,200,054	32 2	130,844	4,735,777	36.2	118,551	3,757,353	31.7
Northern Districts	32,651	1,067,976	32.7	28,997	883,526	30.5	20,792	647,203	31.1
Totals	1,861,469	64,758,053	34 8	1,840,636	75,009,542	40.8	1,681,229	58,987,644	35.1

Notwithstanding a decrease in acreage in the Lake Huron, West Midland, Lake Ontario and East Midland groups, the total increase in the area of oats in the province is 20,833 acres more than in the previous year. The total yield of the province is less by 10,251,489 bushels than in 1891, however, owing to the average yield per acre falling as low as 34.8 bushels, compared with 40.8 bushels in 1891 and an average of 35.1 bushels for the eleven years. The best average yields for the three periods given in the table are recorded in the West Midland district.

RYE.

This crop is grown only to a limited extent, and is utilized as a rule for early soiling. It suffered but little from winter-killing in the season of 1891-2, and its appearance in April was quite satisfactory. But little mention was made of rye in the June bulletin, but the probabilities were that the crop would be in every way a small one. The slight mention made of the crop in the August bulletin however was to the effect that reports concerning it were favorable. The November bulletin also stated that rye had done fairly well. The acreage and yield for 1891 and 1892 by county groups and for the province is given in the following table, together with the average for the eleven years 1882-92:

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.
Lake Erie	11,223	165,839	14.8	7,613	132,517	17.4	11,540	179,072	15.5
Lake Huron	1,447	24,049	16.6	1,060	19,940	18.8	1,029	18,151	17.6
Georgian Bay	1,391	23,559	16.9	2,346	43,510	18.5	2,751	49,135	17.9
West Midland	5,687	95,611	16.8	2,636	50,828	19.3	4,938	81,993	16.6
Lake Ontario	21,352	301,816	14.1	21,254	315,752	14.9	30,646	451,355	14.7
St. Lawrence and Ottawa	18,390	317,409	17.3	21,288	386,831	18.2	31,608	564,330	17.9
East Midland	12,590	183,150	14.5	10,865	169,546	15.6	17,416	270,991	15.6
Northern Districts	993	21,071	21.2	803	15,706	19.6	929	18,120	19.5
Totals	73,073	1,132,504	15.5	67,865	1,134,630	16.7	100,857	1,633,147	16.2

The total acreage of rye was 73,073, which is 5,208 acres more than in the preceding year, although far short of the average acreage of the eleven years. The greatest increase is observed in the Lake Erie group. The average yield per acre for the province was 15.5 bushels, which is less than in 1891, and less also than the average for the eleven years' period. The St. Lawrence counties had the best yield per acre, and the poorest yield was in the Lake Ontario district, which group, by the way, has the largest acreage of rye.

PEAS.

The crop got a late start, as will be seen from the following extract from the June bulletin: "The report as to peas are necessarily incomplete, as, owing to the lateness of the season, sowing was still in progress in many sections. With the exception of the southwest the pea crop of western Ontario is one of great promise, above the average, the most encouraging reports coming from Grey and Simcoe. From Toronto east the returns are uniformly very good, Prince Edward especially reporting a large acreage and fine condition. Present indications point to a fine pea crop over almost the entire province."

The August bulletin was not so bright in its report. It stated that the crop was very variable. "In Essex, Kent, Lambton and Middlesex the crop may be termed a failure owing to the early rains and the bugs. As we go east and north the condition is much improved. Along Lake Ontario the crop is fair, in the east some sections report splendid crops, others close by complete failures. On the whole the crop is much under the average."

Reports of correspondents in November were to the effect that the pea crop was under the average, and that the "bug" had been unusually destructive. The following table gives the acreage and yield for 1891 and 1892, and also the average for the eleven years 1882-92:

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.	Acres.	Bushels.	Bushels per acre.
Lake Erie	59,382	873,754	14.7	65,934	1,309,973	19.9	61,679	1,127,171	18.3
Lake Huron	94,755	1,969,203	20.1	98,334	2,599,112	26.4	83,635	1,858,025	22.2
Georgian Bay	95,115	1,818,872	19.1	91,163	2,297,147	25.2	80,770	1,739,202	21.5
West Midland	154,982	2,734,472	17.6	155,149	3,976,675	25.6	139,326	2,974,565	21.3
Lake Ontario	198,524	4,027,254	20.3	179,439	4,181,917	23.3	158,134	3,198,700	20.2
St. Lawrence and Ottawa	92,334	1,474,026	16.0	90,627	2,253,956	24.9	92,682	1,813,357	19.6
East Midland	63,991	1,241,606	19.4	56,660	1,334,226	23.5	52,865	1,030,911	19 5
Northern Districts	15,649	355,243	22.7	15,147	370,453	24.5	9,487	219,479	23.1
Totals	774,732	14,494,430	18.7	752,453	18,323,459	24.4	678,578	13,961,910	20.6

There has been an increase in acreage in five of the eight county groups, and the total area in peas is now 774,732 acres, or 22,279 acres more than in 1891. The yield per acre is light, the average for the province being 18.7 bushels, compared with 24.4 bushels in the preceding year, and an average of 20.6 bushels for the eleven years. In the Lake Erie counties the average yield per acre was only 14.7 bushels, and in the St. Lawrence and Ottawa group, 16.0 bushels. The Northern Districts however had an average yield per acre of 22 7 bushels. The total yield of the province was 14,494,430 bushels, which is 3,829,029 bushels less than the unusually large crop of the previous year.

CORN.

A late start is a serious matter for the corn crop, and hence it was felt that the outlook for the crop was not of the best when the June bulletin appeared with the following reference to corn: "All over the province, but more particularly in the corn-growing counties of the Lake Erie group, the repeated rains of May greatly hindered corn planting. A few fields on high situations were doing nicely, but on low and level land there was much washing out of seed and yellowing of the young plants, and some replanting will have to be done. The rains have delayed corn planting by a week or ten days, and when correspondents send in their reports fully half the corn area remained to be planted. The weather was then more promising, and there is no reason to doubt that the usual acreage will be given to corn."

The general condition and prospects of the corn crop were briefly summarised in the August bulletin as follows: "Lake Erie, late planted owing to rains, poor, not more than half a crop; Lake Huron, poor in Lambton, better in Huron, best in Bruce; Georgian Bay, good in Grey and Simcoe: Lake Ontario, good on the average, very good on well-drained land; St. Lawrence and Ottawa, fair to good; East Midland good; Northern, little grown, fair. Most of the crop reported upon is for fodder purposes. A continuance of warm weather will greatly improve the crop which is now growing rapidly. On the whole the condition is fair, but the quantity is not so large as usual. Any deficiency of corn ensilage or fodder corn however will be more than made up by the excess of hay this year."

The November bulletin remarked that the past season was less favorable for corn than 1891. The crop was planted late owing to spring rains, and the early growth was retarded, though the late growth was satisfactory. The result is that there is a limited crop of seed corn, but it is of fair quality. Corn on low land was slightly touched by frost in many districts. The acreage of corn planted was greater than in the preceding year; the amount of corn produced for fodder was only 10.38 tons per acre. The table following gives the acreage and yield of corn for 1892, by county groups and for the province, divided into the two classes "for husking" and "for fodder," together with the total area and yield for 1891, 1892, and the average for the eleven years:

Districts.	1892. For husking.			1892. For Fodder.			Total area.		
	Acres.	Bushels (in the ear)	Bushels per acre.	Acres.	Tons.	Tons per acre.	1892. Acres.	1891. Acres.	Average 1882-92. Acres.
Lake Erie	90,843	5,616,019	61.8	8,435	69,529	8.24	99,278	101,037	95,368
Lake Huron	10,606	610,018	57.5	6,441	70,436	10.94	17,047	15,318	11,229
Georgian Bay	1,712	105,266	61.5	4,834	62,752	12.98	6,546	3,125	2,135
West Midland	19,927	1,277,179	64.1	17,760	182,372	10.27	37,687	33,377	29,636
Lake Ontario	26,488	1,671,387	63.1	19,230	179,565	9.34	45,718	36,251	31,898
St. Lawrence and Ottawa	23,560	1,426,673	60.6	28,445	320,267	11.26	52,005	40,570	24,107
East Midland	7,944	501,961	63.6	6,078	62,486	10.28	14,022	10,878	8,126
Northern Districts	383	17,995	47.0	180	1,500	8.33	563	530	378
Totals	181,463	11,229,498	61.9	91,403	948,907	10.38	272,866	241,086	202,877

The area of corn reported in the province is 272,866 acres, of which 181,463 acres—about two-thirds—are devoted to husking corn. Of this corn grown for the ear fully one half is raised in the counties comprising the Lake Erie group, the only district which shows a decrease in acreage. The largest area for corn for fodder (including the silo) is found in the cheese district known as the St. Lawrence and Ottawa group. The yield per acre of corn in the ear for the province was 61.9 bushels, which is about an average compared with the record for ten years. Fodder corn averaged 10.38 tons per acre, ranging from 8.33 tons in the Northern Districts to 12.98 tons in the Georgian Bay group.

BUCKWHEAT.

This crop, which is confined chiefly to the Lake Ontario and St. Lawrence and Ottawa counties, is not reported upon by many of our correspondents. Those who wrote, however, spoke rather favorably of its condition, and very little injury was reported by early frosts. The appended table gives acreage and yield for 1891 and 1892, together with the average for the eleven years 1882-92 :

Districts.	1892.			1891.			Yearly average for the eleven years 1882 92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Lake Erie	15,217	288,391	19.0	14,010	353,608	25.2	10,981	205,310	18.7
Lake Huron	2,614	55,240	21.1	1,837	46,940	25.6	1,336	24,602	18.4
Georgian Bay	3,085	71,836	23.3	1,547	29,341	19.0	1,026	18,624	18.2
West Midland	3,562	66,315	18.6	2,781	63,433	22.8	2,498	44,879	18.0
Lake Ontario	48,638	1,009,593	20.8	34,795	821,230	23.6	21,150	438,335	20.7
St. Law. and Ottawa.	35,577	676,024	19.0	36,733	936,792	25.5	29,365	619,065	21.1
East Midland	15,346	327,268	21.3	14,862	324,330	21.8	7,306	149,206	20.4
Northern Districts	1,065	26,547	24.9	1,314	32,468	24.7	647	14,544	22.5
Totals	125,104	2,521,214	20.2	107,879	2,608,142	24.2	74,309	1,514,565	20.4

The acreage of the province is somewhat larger than last year, the greatest gain occurring in the Lake Ontario group ; there was a slight decrease, however, in the St. Lawrence and Ottawa counties and the Northern Districts. The average yield per acre was 20.2 bushels, compared with 24.2 bushels in the previous year, and an average of 20.4 bushels for the eleven years 1882-92. The total yield was less than that of 1891.

BEANS.

Correspondents writing under date of June 1st stated that the planting of this crop, as in the case of corn, has been delayed by wet weather, making it difficult to prepare the soil for the seed. Very little had yet been planted in Kent and adjacent counties, where most of our beans are raised, and some correspondents ventured the opinion that the area grown would not be as large as usual.

The August bulletin stated that the crop promised well, but that it was then too early to be very accurate in making an estimate, as the crop was a little late.

The November reports were not favorable, as owing to late planting and drouth of midsummer the crop was not only limited in area, but also light in quality and yield.

The table following gives the yield and acreage by county groups and for the Province for 1891 and 1892, and for the eleven years 1882-92 :

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Lake Erie.....	25,369	388,731	15.3	32,706	582,169	17.8	18,745	320,779	17.1
Lake Huron	682	9,467	13.9	1,024	21,090	20.6	636	11,347	17.8
Georgian Bay	263	5,975	22.7	307	6,782	22.1	250	4,379	17.5
West Midland.....	812	15,385	18.9	717	14,161	19.7	1,149	18,746	16.3
Lake Ontario.....	1,953	35,401	18.1	1,838	37,685	20.5	2,126	38,696	18.2
St. Law. and Ottawa.	3,057	58,532	19.1	4,145	94,237	22.7	3,256	69,293	21.3
East Midland	956	19,665	20.6	559	10,317	18.5	590	10,542	17.9
Northern Districts...	157	2,775	17.7	155	3,159	20.4	89	1,659	18.6
Totals.....	33,249	535,931	16.1	41,451	769,600	18.6	26,841	475,441	17.7

A decided decrease has taken place in the acreage of beans, the falling off being chiefly in the Lake Erie group, where the greater part of the crop is grown. In that group also the yield per acre was light, reducing the average yield of the province to 16.1 bushels per acre, compared with 18.6 bushels in the preceding year, and an average of 17.7 bushels for the eleven years. The total yield was just about five-sevenths of that of 1891; and the West Midland group alone had the honor of exceeding its last year's figures.

HAY AND CLOVER.

The April bulletin thus referred to the crop : "As in the case of fall wheat, clover wintered well. The crop had not however made much advancement at the time of writing, and no very positive opinion could be expressed as to the outlook. The present indications are that over the greater portion of the province it will average a very light yield. The most favorable reports come from the Lake Huron and Georgian Bay counties —particularly from Simcoe, Grey and Bruce—where the indications for a fair yield are satisfactory. In nearly all other parts of the province the drouth of last summer did much harm to old fields, while the catch of seed in the fall was for the most part uneven. The plant is consequently too thin on the ground for a heavy crop of clover hay to be looked for. Elsewhere than in the districts above mentioned, considerable damage has been caused from heaving, especially on old meadows and on low, undrained soils. The recent heavy frosts have also injured red clover to some extent."

The prospects in June were brighter. The bulletin issued early in that month said : "During the past few weeks the hay crop has made wonderful growth owing to the continuous rains. Since our last report, the prospects of the crop have continued steadily to improve, so that now a heavy yield is assured. The appearance of timothy was perhaps never better than at present. Although clover was badly winter-killed and still looks uneven and patchy, yet what survived is making strong growth and is looking well."

The August reports confirmed the cheerful expectations of the June bulletin : "The best crop of this year is that of timothy and clover hay. The harvesting began in Essex on June 20th, and on August 10th there was still a considerable acreage to be cut in Muskoka, Algoma and Nipissing. For the larger portion of the province haying extended from the beginning to the end of July, when it was interrupted by the rapid maturing of the fall wheat. The result of this is that much hay was left until after the wheat had been secured and there will doubtless be a considerable quantity over-mature. On the

whole the yield has been extraordinary, seldom less than one and a half tons per acre and in some cases it is reported to have gone over three tons per acre. The most of it was harvested in good condition; rains did a little damage in Grey and elsewhere. Timothy is better than clover as the latter suffered some, especially in the west, from winter-killing. The quantity and quality of crop promise to be exceptionally good." The acreage and yield by county groups, and for the province is as follows:

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Tons.	Tons per acre.	Acres.	Tons.	Tons per acre.	Acres.	Tons.	Tons per acre.
Lake Erie	278,637	484,623	1.74	298,233	298,329	1.00	276,651	400,924	1.45
Lake Huron	285,802	512,063	1.79	277,622	245,810	.89	242,015	339,111	1.40
Georgian Bay	223,318	379,498	1.70	219,568	208,809	.95	196,942	259,232	1.32
West Midland	441,377	847,025	1.92	435,867	498,241	1.14	413,789	640,190	1.55
Lake Ontario	430,761	781,253	1.81	444,932	429,630	.97	411,952	581,956	1.41
St. Lawrence & Ottawa	614,130	1,020,714	1.66	626,893	546,845	.87	566,257	753,825	1.33
East Midland	174,078	250,712	1.44	184,330	124,592	.68	157,836	188,173	1.19
Northern Districts	67,264	108,950	1.62	62,530	40,542	.65	45,496	55,877	1.23
Totals	2,515,367	4,384,838	1.74	2,549,975	2,392,798	.94	2,310,938	3,219,288	1.39

Notwithstanding the fact that there are 34,608 acres less of an area, the total yield is nearly double that of 1891, owing to the fact that the average yield per acre in that year was an exceptionally small one, being only .94 ton, while that of 1892 is 1.74 ton, or .35 ton more than the average for the eleven years The West Midland counties average 1.92 ton per acre. The smallest average yield per acre, 1.44, is seen in the East Midland group, although even this exceeds the provincial average for the eleven years.

Clover Seed. The crop of red clover seed will not be up to the average of past years or equal to what the growth of the plant indicated. Owing to unfavorable weather in so many sections, the seed has not filled well and the midge has been destructive all over the province. From various causes the total yield of clover seed will be light, the most favorable reports coming from Middlesex, Haldimand Durham and Norfolk. Four-fifths of the correspondents report smaller acreage of clover for seed and light crops. Very little appears to have been grown in the east and north. The reports as to alsike however are on the whole quite favorable and the yield will probably be very good. More definite information cannot at this time be given as very little threshing of clover seed is reported to have taken place.

FIELD ROOTS.

Correspondents writing for the June bulletin stated that comparatively little had been done with roots owing to wet weather at seeding time. In the August bulletin, however, the condition of roots was regarded as promising, although late, and the rush of other crops not having allowed much time for cleaning. The November bulletin dealt more fully with each crop, as will be seen in the following paragraphs.

POTATOES.—The weather greatly delayed the planting of potatoes in most sections. From the Lake Erie counties came reports for the June bulletin of the rotting of potato seed in the ground, and more scattered reports to a similar effect came from other parts of Western Ontario. The August bulletin looked for a fair crop only, as the wet had done great damage in the south-western districts, and bugs were reported as unusually destructive in all sections. The crop was expected to be an uneven one, a failure on low and heavy land, and grand crops on light, well-drained soils, being reported from the same districts.

The November bulletin had the following regarding potatoes: "Rain, drouth and rot, in the order named, have been playing havoc with potatoes. Owing to early rains much late planting and re-planting had to be done, and later on the exceedingly dry weather prevailing prevented a normal development of the tubers. There are consequently many small potatoes. Rot has appeared in almost every locality, and in some instances farmers have left their potatoes undug as not being worth the trouble. Odd fields on high, well-drained sandy soils have done well, but there are not many such. Several correspondents say that there will not be enough potatoes for seed in their neighborhoods. Owing to the tendency to rot in cellar and in pit the average yield per acre presented in the table must be discounted to a considerable degree."

The acreage and yield is given in the following table by county groups and for the province for 1891 and 1892, together with the average for the years 1882-92:

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels	Bush. per acre.
Lake Erie	14,915	994,974	66.7	14,518	1,726,531	118.9	15,847	1,638,443	103.4
Lake Huron	11,895	943,917	79.4	13,401	2,111,991	157.6	12,757	1,465,647	114.9
Georgian Bay	13,687	1,242,619	90.8	14,870	2,311,767	155.5	13,795	1,754,886	127.1
West Midland	23,964	2,019,875	84.3	26,911	4,251,297	158.0	26,508	3,122,131	117.8
Lake Ontario	29,371	2,815,073	95.8	33,458	4,616,546	138.0	31,612	3,528,179	111.6
St. Lawrence&Ottawa	36,441	2,540,351	69.7	40,040	6,449,536	161.1	38,647	4,754,116	123.0
East Midland	11,274	1,121,153	99.4	12,526	1,790,550	142.9	12,235	1,501,074	122.7
Northern Districts	4,156	611,855	147.2	4,494	797,668	177.5	3,162	482,674	152.6
Totals	145,703	12,289,817	84.3	160,218	24,055,886	150.1	154,563	18,245,150	118.0

The acreage of the province is below that of the previous year, and less also than that of the average of the eleven years. The Lake Erie district is the only one showing a larger area of potatoes than in 1891. The average yield per acre is 84.3 bushels, compared with 15.1 bushels in the preceding year, and an average of 118.0 for the eleven years. The total yield of the province reaches only 12,289,817 bushels, being about half that of the preceding year, and about two-thirds of the average yield for the eleven years. The Northern Districts, as usual, give the best average yield per acre, while the smallest average yield is found in the Lake Erie group.

MANGEL-WURZELS. Correspondents had but little to say regarding mangels. The crop was regarded as rather backward in August, but even then, as in the November

reports, the expressions regarding the general prospect were hopeful in tone. The yield and acreage is given in the following table, by county groups and for the province :

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Lake Erie	1,695	681,194	402	1,846	893,381	484	1,404	563,795	402
Lake Huron	2,691	1,390,785	517	2,892	1,568,156	542	2,466	1,117,437	453
Georgian Bay	814	395,362	486	897	397,180	443	980	415,103	424
West Midland	6,702	3,068,005	458	8,347	4,614,874	553	6,464	2,983,242	462
Lake Ontario	5,855	2,889,080	493	4,859	2,399,151	494	5,213	2,338,275	449
St. Lawrence & Ottawa	2,108	802,748	381	2,166	1,018,671	470	1,792	683,523	381
East Midland	2,068	1,090,798	527	1,872	859,238	459	1,371	578,607	422
Northern Districts	93	32,502	349	82	28,797	351	82	22,875	279
Totals	22,026	10,350,474	470	22,961	11,779,448	513	19,772	8,702,857	440

The total area is slightly less than that of the preceding year, although a substantial increase is observed in the Lake Ontario group. The average yield per acre is 470 bushels, which, while 30 bushels more than the average for the eleven years, is 43 bushels short of the average yield of 1891. The total yield is therefore 1,428,974 bushels less than in the preceding year. The best average yield per acre is found in the Lake Huron district, and the poorest in the St. Lawrence and Ottawa counties.

Carrots. Notwithstanding their backward appearance early in the season, carrots turned out well, although correspondents did not give much space to describing the crop. The yield would probably have been better still, but for the fact that the harvesting of the grain crops prevented as careful cleaning of roots as usual. The following table gives acreage and yield by county groups and for the province :

Districts.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Lake Erie	895	268,228	300	834	305,715	367	744	216,403	291
Lake Huron	844	333,552	395	982	382,209	389	986	352,588	358
Georgian Bay	955	375,491	393	903	344,301	381	1,093	401,408	367
West Midland	1,722	674,280	392	1,885	875,220	464	2,187	822,286	376
Lake Ontario	2,052	868,782	423	1,917	718,633	375	2,701	1,017,618	377
St. Lawrence & Ottawa	2,196	772,727	352	2,230	809,609	363	1,667	530,874	318
East Midland	938	419,651	447	833	289,938	348	833	286,582	344
Northern Districts	339	114,650	338	274	88,391	323	168	46,862	279
Totals	9,941	3,827,361	385	9,858	3,814,016	387	10,379	3,674,621	354

There is very little to notice in acreage or yield compared with the previous year. The acreage is a little larger and the average yield a trifle less. The average yield per acre is unusually high in the East Midland group, but very light in the Lake Erie counties.

TURNIPS. Seeding was delayed by wet weather, but turned out fairly well. The crop was attacked by "caterpillars" in some quarters, and there was a tendency to become "rooty" on low lands, but otherwise nothing serious was reported. Broken weather in the fall delayed the storing of turnips. The acreage and yield by county groups and for the province is given below :

Districts.	1892.			1891.			Yearly average for the eleven years 1882 92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Lake Erie	3,095	1,060,595	343	2,716	1,205,035	444	2,312	819,430	354
Lake Huron	16,253	8,623,849	531	15,136	8,289,606	548	13,122	5,485,775	418
Georgian Bay	16,097	7,612,242	473	15,182	8,585,368	565	12,925	5,471,374	423
West Midland	40,433	20,097,485	497	38,414	23,198,607	604	35,556	15,313,466	431
Lake Ontario	36,791	18,864,814	513	37,491	19,969,208	533	30,586	13,182,057	431
St. Lawrence & Ottawa	5,327	2,107,319	396	5,518	2,619,058	475	4,260	1,524,091	358
East Midland	8,859	4,194,882	474	8,031	3,678,599	458	6,149	2,310,054	376
Northern Districts	2,772	980,455	354	3,587	1,307,971	365	2,277	744,157	327
Totals	129,627	63,541,641	490	126,075	68,853,452	546	107,187	44,850,404	418

The area of turnips now reaches 129,627 acres, which is 3,552 acres more than in 1891. The average yield per acre, 490 bushels, is 56 bushels below that of the previous year, although far above the average for the eleven years. The total yield is 5,311,811 bushels less than in 1891. The increased area is seen chiefly in the west.

COMPARATIVE YIELD OF FIELD CROPS.

AGGREGATE YIELD OF FIELD CROPS. The following table presents the total yield of the field crops named for each of the past five years, together with the averages for the eleven years 1882-92 :

Field Crops.	1892.	1891.	1890.	1889.	1888.	1882 92.
	bushels.	bushels.	bushels.	bushels.	bushels.	bushels.
Fall wheat	20,492,497	21,872,488	14,267,383	13,001,865	13,830,787	18,280,440
Spring wheat	8,290,395	10,711,538	7,683,905	5,697,707	6,453,559	8,829,125
Barley	12,274,318	16,141,904	15,600,169	23,386,388	23,366,569	18,706,166
Oats	64,758,053	75,009,542	52,768,207	64,346,301	65,466,911	58,987,644
Rye	1,132,504	1,134,630	1,563,345	1,431,679	1,295,302	1,633,147
Peas	14,494,430	18,323,459	15,389,313	13,509,237	14,269,863	13,961,910
Buckwheat	2,521,214	2,608,142	2,053,720	1,272,578	2,222,283	1,514,565
Beans	535,931	769,600	761,341	271,893	534,526	475,441
Potatoes	12,289,817	24,055,886	17,561,117	14,355,529	22,273,607	18,245,150
Mangel-wurzels	10,350,474	11,779,448	11,594,518	7,223,478	10,020,659	8,702,857
Carrots	3,827,361	3,814,016	4,210,542	3,431,959	3,898,584	3,674,621
Turnips	63,541,641	68,853,452	47,040,563	37,021,260	47,640,237	44,850,404
	tons.	tons	tons	tons.	tons.	tons.
Hay and clover	4,384,838	2,392,798	4,305,815	3,728,313	2,009,017	3,219,288

It must be remembered that variations in the acreage, as well as in the average yield, account for the differences in the aggregate yields of the various years. The year 1891 appears to be the best in the table, taking it all together, although in that year hay was a very poor crop. None of the remaining years equal 1892 in general yield.

RATIOS OF AGGREGATE CROPS. In the following table the ratio of yield of each crop is given by county groups and for the province, 100 representing the average for the eleven years 1882-92 :

Districts.	Fall wheat.	Spring wheat.	Barley.	Oats.	Rye.	Peas.	Buckwheat.	Beans.	Hay and Clover.	Potatoes.	Mangel-wurzels.	Carrots.	Turnips.
Lake Erie	117	70	70	94	93	78	140	121	121	61	121	124	129
Lake Huron	106	115	60	113	132	106	225	83	151	64	124	95	157
Georgian Bay	104	76	88	126	48	105	386	136	146	71	95	94	139
West Midland	115	105	69	106	117	92	148	82	132	64	103	82	131
Lake Ontario	118	79	63	109	67	126	230	91	134	80	124	85	143
St. Lawrence and Ottawa	74	115	60	110	56	81	109	84	135	53	117	146	138
East Midland	78	92	58	112	68	120	219	187	133	75	189	146	182
Northern Districts	156	90	153	165	116	162	183	167	195	127	142	245	132
The Province	112	94	66	110	69	104	166	113	136	67	119	104	142

In the foregoing statement both acreage and yield combine to give the result. There are only four crops failing to reach 100, namely, spring wheat, barley, rye and potatoes. Barley and potatoes do not reach the standard in any group outside of the Northern Districts. Buckwheat and turnips have the highest ratios for the province, and go above 100 in every group.

RATIOS OF YIELD PER ACRE. In the following table the yield per acre only is the factor in the comparison. The average yield for the eleven years 1882-92 is represented by 100, and the yield for 1892 is compared by county groups and for the province :

Districts.	Fall wheat.	Spring wheat.	Barley.	Oats.	Rye.	Peas.	Buckwheat.	Beans.	Hay and clover.	Potatoes.	Mangel-wurzels.	Carrots.	Turnips.
Lake Erie	97	72	91	87	95	80	102	90	120	65	100	103	97
Lake Huron	104	94	93	103	94	91	115	78	128	69	114	110	127
Georgian Bay	107	83	102	109	94	89	128	130	129	71	115	107	112
West Midland	113	85	93	99	101	83	103	116	124	72	99	104	115
Lake Ontario	106	68	95	100	96	100	100	99	128	86	110	112	119
St. Lawrence and Ottawa.	123	101	91	98	97	82	90	90	125	57	100	111	111
East Midland	98	75	97	102	93	99	104	115	121	81	125	130	126
Northern Districts	126	86	104	105	109	98	111	95	132	96	125	121	108
The Province	105	82	95	99	96	91	99	91	125	71	107	109	117

Taking the figures for the province it will be observed that but five of the crops, namely, fall wheat, hay and clover, mangel-wurzels, carrots and turnips go above 100, although oats and buckwheat reach 99. The Georgian Bay group goes over the standard in the case of nine out of the thirteen items named in the table.

ONTARIO VS. AMERICAN STATES. A comparison of the average yield per acre of cereals in Ontario and the principal grain-growing states of the American Union is presented in the following table for the eleven years 1882-92.

——	1892.	1891.	1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1882-92.
Fall wheat:	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Ontario	**21.2**	**25.7**	**19.8**	**15.8**	**16.7**	**16.1**	**20.4**	**24.5**	**24.0**	**10.6**	**26.3**	**20.1**
New York	14.3	16.6	15.2	13.8	14.1	15.2	16.3	15.4	16.5	10.3	15.7	14.9
Pennsylvania	14.4	14.8	12.0	12.3	13.5	9.7	12.7	9.7	13.6	13.2	13.6	12.7
Ohio	13.2	17.1	12.5	14.6	10.8	13.1	15.0	10.2	15.3	10.0	15.1	13.4
Michigan	14.7	17.6	15.2	14.7	14.6	13.3	16.0	19.3	16.5	14.0	16.3	15.6
Indiana	14.0	17.7	9.5	14.7	10.4	13.5	14.8	10.6	12.5	10.4	16.5	13.1
Illinois	16.7	17.8	11.5	16.0	13.7	15.2	13.7	8.5	11.6	10.0	17.7	13.9
Missouri	12.1	13.2	11.2	13.0	12.0	16.2	13.2	7.4	11.8	10.1	11.8	12.0
Kansas	17.0	15.5	13.5	18.4	15.2	9.6	11.4	10.6	16.5	17.5	19.9	14.9
California	12.8	11.7	12.0	13.3	12.1	11.0	11.6	9.4	13.2	13.0	13.0	12.1
Spring wheat:												
Ontario	**12.7**	**21.0**	**12.8**	**14.3**	**17.5**	**11.6**	**16.5**	**11.4**	**20.2**	**16.6**	**16.5**	**15.4**
Wisconsin	11.5	13.5	12.5	14.2	11.5	10.3	11.5	11.5	14.0	12.3	14.4	12.5
Minnesota	11.7	17.6	12.0	14.6	9.0	11.6	14.0	11.1	15.0	13.0	13.0	13.0
Iowa	11.5	15.3	11.7	13.1	9.8	10.0	12.2	11.3	12.0	11.3	10.3	11.7
Nebraska	13.5	15.0	11.1	12.0	9.3	10.1	11.0	11.3	14.5	15.5	11.0	12.2
Dakota	12.3	16.5	9.0	9.4	9.7	14.3	11.5	12.8	14.5	16.0	15.9	12.9
Barley:												
Ontario	**24.6**	**29.2**	**22.2**	**26.7**	**26.1**	**22.3**	**26.5**	**27.7**	**27.3**	**24.3**	**28.6**	**25.9**
New York	22.2	23.3	16.7	21.1	21.8	20.3	22.0	22.0	22.5	24.2	24.8	21.9
Wisconsin	25.5	26.5	22.7	24.5	22.5	18.5	22.0	26.5	23.2	24.1	25.0	23.7
Minnesota	24.9	27.3	22.5	25.6	18.5	19.0	22.0	23.8	24.2	22.9	23.3	23.1
Iowa	21.1	27.3	22.6	22.4	21.0	19.0	22.5	23.0	22.3	21.9	22.6	22.3
Nebraska	22.2	27.2	17.3	22.7	22.5	21.0	22.0	23.4	21.0	22.1	23.0	22.2
California	24.0	23.7	22.3	20.3	20.0	20.5	22.2	18.1	23.6	16.2	16.4	20.7
Oats:												
Ontario	**34.8**	**40.8**	**28.0**	**33.5**	**35.4**	**29.6**	**36.2**	**35.8**	**38.9**	**38.5**	**36.4**	**35.1**
New York	28.0	31.5	17.8	24.5	28.1	23.5	28.7	27.9	30.0	31.3	29.9	27.4
Pennsylvania	24.5	27.2	17.2	26.2	26.5	25.5	28.7	26.3	27.9	30.6	27.3	26.2
Ohio	22.5	32.3	18.5	32.3	31.8	30.0	32.4	37.3	28.0	33.9	26.4	29.6
Michigan	29.1	32.5	25.0	33.7	33.2	29.6	29.5	35.4	33.4	34.6	31.7	31.6
Indiana	25.9	26.0	16.3	27.7	26.5	27.0	30.7	26.8	30.0	29.7	26.8	26.7
Illinois	26.5	34.0	18.0	37.5	35.8	29.5	31.8	32.8	32.8	36.1	40.7	32.3
Wisconsin	30.0	36.3	28.0	35.5	29.4	24.2	28.4	33.8	33.5	30.4	29.6	30.9
Minnesota	27.5	37.5	26.6	28.0	28.7	30.0	34.4	34.9	35.2	33.1	35.7	31.9
Iowa	25.2	39.2	26.5	34.5	26.2	30.5	34.1	33.8	36.7	34.1	31.0	32.0
Missouri	20.0	25.3	17.4	25.5	25.2	29.3	23.4	22.3	26.7	28.7	30.1	24.9
Kansas	28.5	33.2	25.0	31.5	25.3	26.6	26.4	31.8	35.0	39.4	27.0	30.0
Nebraska	27.3	32.3	21.3	31.6	25.8	27.5	29.5	34.3	33.7	40.0	23.5	29.7

The above states with which a comparison of Ontario's grain-producing power is made are, as stated, the principal grain-growing states of the American Union. The average yields per acre are taken from the Annual Reports of the United States Department of Agriculture and are, like those of Ontario, carefully compiled from actual results of threshing. Ontario leads in fall wheat in 1892 and in the average for the eleven years of the Bureau's existence; Michigan holds second place, being 4½ bushels per acre below Ontario's average. In spring wheat Nebraska leads in 1892, but in the eleven years' average Ontario beats its next competitor by 2.4 bushels per acre. In barley in 1892 Ontario holds third place, but for the eleven years' record it holds first place. Ontario holds first place for oats in 1892 and the average for the period of eleven years, the nearest rival for the period being Illinois, with an average 2.8 bushels below.

Average Yields per Acre. The next table gives the average yield of each of the staple field crops by county groups for 1892, and for the province for both 1891 and 1892, together with the average for the province for the eleven years 1882-92:

Field crops.	Lake Erie.	Lake Huron	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.		
									1892.	1891.	1882-92.
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.
Fall wheat	18.6	21.0	22.2	23.5	21.8	22.2	19.1	25.3	21.2	25.7	20.1
Spring wheat	10.3	13.4	12.2	12.9	10.8	16.9	10.7	15.3	12 7	21.0	15.4
Barley	22.3	24.8	26.1	26.3	24.7	22.1	23.3	24.7	24.6	29.2	25.9
Oats	30.8	36.4	36.4	37.7	36.7	32.0	32.2	32.7	34.8	40.8	35.1
Rye	14.8	16.6	16.9	16.8	14.1	17.3	14.5	21.2	15.5	16.7	16.2
Peas	14.7	20.1	19.1	17.6	20.3	16.0	19.4	22.7	18.7	24.4	20.6
Buckwheat	19.0	21.1	23.3	18.6	20.8	19.0	21.3	24.9	20.2	24.2	20.4
Beans	15.3	13.9	22.7	18.9	18.1	19.1	20.6	17.7	16.1	18.6	17.7
Potatoes	66.7	79.4	90.8	84.3	95.8	69.7	99.4	147.2	84.3	150.1	118.0
Mangel-wurzels	402	517	486	458	493	381	527	349	470	513	440
Carrots	300	395	393	392	423	352	447	338	385	387	354
Turnips	343	531	473	497	513	396	474	354	490	546	418
	ton.	ton.	ton.	ton.	ton.	ton.	ton.	ton.	ton.	ton.	ton.
Hay and clover.	1.74	1.79	1.70	1.92	1.81	1.66	1.44	1.62	1.74	.94	1.39

Of the thirteen crops reported upon, fall wheat, rye, peas, buckwheat and potatoes have largest average yields in the Northern Districts, while the West Midland group is credited with the best average yields for barley, oats and hay. The East Midland counties lead in mangel-wurzels and carrots, the Lake Huron in turnips, the Georgian Bay in beans and the St. Lawrence and Ottawa in spring wheat. The averages yields for the province for 1892 compared with those for 1891 are less in every instance except the item of hay and clover; but fall wheat, mangel-wurzels, carrots, turnips and hay and clover exceed their respective averages for the eleven years.

FRUIT AND FRUIT TREES.

Spring opened up somewhat earlier than usual, but as the weather remained dry and cool, vegetation made but little headway until the beginning of April. During the few warm days at the early part of the month, grass made a vigorous start, and the fields in the southern and western portions of the province are quite green. But on account of the unfavorable weather at the middle of the month, all growth was more or less arrested, and vegetation was in a backward condition, as correspondents wrote for the April bulletin.

The June bulletin contained the following regarding orchard and garden: "Vegetation appears to be about a week backward. In many places the woods were only in earliest leaf, but the genial weather just ushered in gave promise of a more generous foliage. While in some of the northern counties apple blossoms were only just beginning to show, the more southern sections reported the bloom as well advanced, and with but few exceptions the accounts regarding this staple of our orchards were most favorable. It was stated, however, that notwithstanding the abundance of blossom, the heavy rains prevailing at the time of bloom may have washed off much of the pollen, and that imperfect fertilization may result. Pears where grown promise well. Peaches along the Lake Erie and Lake Ontario counties were more or less injured by the winter. Plums and cherries are still assailed by their enemy, the black-knot. A few localities report a profusion of plum blossoms, but in some of the recognized plum sections the yield is not expected to reach that of last year. In eastern Ontario the interest in orcharding appears to be developing. From various points come reports regarding winter injury to grapes, but in the main the remarks of correspondents are hopeful. Strawberries were hurt by frost and "heaving" on a few exposed fields, but the general condition is far from unsatisfactory. Raspberries appear to have sustained more injury than any other fruit. Other small fruits came through the winter well. The fruit prospect is on the whole encouraging."

August reports were not very satisfactory, as may be seen from the following extract from the bulletin of that month: "This is on the whole a poor year for fruit. Berries have been generally an abundant crop of fair quality. Cherries can be set down as nothing other than a total failure. Peaches in both the Niagara and southwestern districts are very scarce, almost a failure. Plums in most cases are a small crop, below the average. The black-knot is reported to be killing out the cherry and plum trees at a rapid rate, and the curculio has affected the plums very much. Pears are generally reported as an abundant crop of good condition in all parts of Ontario. Grape vines in most sections are heavily laden and prospects are very good though mildew and rot are feared by many. Apples, which are reported on at length elsewhere, are somewhat limited in quantity and inferior in quality. This appears to have been a year peculiarly unfortunate in the destruction of blossoms and in the production of all sorts of fruit pests and parasites. The larger fruits may be arranged in the following order from best to poorest: pears, plums, apples, peaches, cherries."

November reports were more reassuring, as will be seen by the following from the bulletin issued early in that month: "With the exception of the cherry and the plum, which are being rapidly thinned out by the blank-knot, fruit trees appear to be healthy, and have suffered but little from blight or storms. The curculio has also helped to keep down the yield of plums. The reports on apples show a great variation in different localities. The yield was light in most of the Lake Erie counties and also in Lambton, but in Huron, Bruce, Grey and Simcoe and several of the West Midland, Lake Ontario and St. Lawrence and Ottawa counties a surplus was reported. Several correspondents in the county of Grey report that buyers could not get enough barrels to pack the fruit in, and hundreds of bushels of apples had to be fed to the hogs or to lie rotting in piles which had been made ready for the packers Prices for selected apples were from $1.25 to $1.50 per barrel, though farmers were selling as low as 25 cents a bag in several quarters. There appear to be too many fall or early apples grown. The codling moth was worse than usual and wormy fruit is common. There is also a large proportion of spotted or scabby apples. Unless packers have been very careful Ontario apples will hardly keep up their reputation this year for first-class appearance and quality. Pears, notwithstanding blight in some sections, yielded well and will be of good form and size. Grapes suffered but little from mildew and bore fairly well. The absence of fall frosts enabled the fruit to hang on the vines for an unusually late period, thus ensuring perfect ripening. Small fruits were only moderate in yield, excepting wild raspberries, which were plentiful. However the fall has permitted the new wood to ripen well, and the bushes enter the winter in good condition."

The table following presents the areas in orchard and garden for each of the five years 1888-92, together with the rate per 1,000 acres cleared in 1892, by county groups and for the province:

Year.	Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
1892	42,412	22,815	12,351	38,598	56,275	11,686	9,416	545	194,098
1891	40,802	22,167	11,858	37,704	53,267	12,011	9,130	893	187,832
1890	39,517	21,600	11,858	37,338	52,438	11,098	8,330	617	182,796
1889	39,699	21,105	11,729	37,256	52,242	12,079	8,130	526	182,766
1888	38,015	20,342	11,620	36,524	53,881	11,733	7,839	603	180,557
Rate per 1,000 acres cleared, 1892	29.3	16.6	11.4	16.5	24.2	4.9	10.8	3.1	16.2

The total area in orchard and garden now reaches 194,098, being 6,266 of an increase over the previous year. The St. Lawrence and Ottawa counties and the Northern Districts however fail to equal their respective figures of 1891 Out of every 1,000 acres of cleared land in the Province 16.2 are in orchard and garden. This ratio falls as low as 3.1 in the Northern Districts and 4.9 in the St. Lawrence and Ottawa counties, but goes as high as 29.3 in the lake Erie group.

FARM SUPPLIES IN THE SPRING.

The following appeared in the April bulletin: "There is barely sufficient hay in farmers' hands to meet local demands, and only in rare instances is there any for sale. In some districts not more than one-twentieth of the wheat of last season remains unsold, in other districts at least one-third has been held for a higher price. Taking the province as a whole, at least one-fifth of last year's wheat is yet in farmers' hands. Oats are everywhere reported plentiful. A large portion of the extraordinary crop of 1891 still remains unmarketed, especially in the eastern counties. It may be worth while calling attention to the contrast between the above report and that of May, 1891. One year ago hay was abundant and cheap, oats very scarce and dear, and many farmers were buying their flour; this spring hay is scarce, wheat plentiful and oats abundant. The supply of fat cattle is hardly up to the average, owing to the shortage of hay. Beyond the requirements of home demand and those already disposed of, there are not many fat animals available, but the supply is greatest in the West Midland counties The supply of store cattle is up to the average, and is a little greater than home demands."

FALL PLOWING.

The November bulletin said: "Owing to the late harvest plowing was not begun as early as usual. Although reports from the same sections are often contradictory, operations were fairly well advanced by the end of October except on clay lands which had become baked by the long drouth of the early fall. The rains of the first week of November however greatly improved the condition of these fields and at last accounts plowing was going on with a rush, and in many quarters had been finished."

THRESHING AND MARKETING.

"Except in the eastern portion of the province," remarked the November bulletin, "threshing was far advanced, and in many instances completed when correspondents furnished reports. Peas were scarce and in demand, and found an early market, but wheat and barley were being marketed "reluctantly," to quote a word used by a correspondent, owing to the low prices prevailing. Barley was being fed largely on account of the low market price of forty cents and the scarcity of peas, and some correspondents expressed the opinion that unless something higher was paid for wheat it would be better to feed that too."

FARM IMPROVEMENTS.

The November bulletin had the following to say regarding farm improvements: "In the Lake Erie and other western groups a considerable amount of underdraining was done during the season, and there was plenty of tile, although skilled labor was rather scarce. Very few correspondents speak a good word for the tile draining machines. In the eastern part of the province there has been but little underdraining done, and that chiefly with stone or wood, owing to the cost of tile, and the difficulty in getting it. Marked improvement is being made in fencing. The old 'snake fence' is being transformed into a straight railed fence with the aid of wire, and wire fencing of various designs is also in favor. With the change of fencing there is a noticeable tendency to larger fields. While some speak of improvements in the way of placing stone basements for stables, etc., under the old style barns, and the introduction of a more modern style of buildings generally, the bulk of our correspondents express the opinion that low prices and hard times are unfavorable to much improvement in farm property at present."

Remarks of Correspondents.

Colchester S., Essex: Sorghum is grown extensively in Essex, more especially in this township. It requires a long season to bring it to maturity, and should be planted early in May.

Gosfield N., Essex: Considerable Hungarian grass was raised here this year on land prepared for corn, but which, on account of the excessive rains, had not been planted. The result was an excellent crop of Hungarian grass, which will be a great help in feeding stock, as the quantity of corn fodder is only about half as much as usual.

Malden, Essex: Since the introduction of the disc harrow and the spring-tooth cultivator but few farmers plow their corn stubble, preferring to use the disc or spring-tooth in the spring.

Mersea, Essex: I had the only patch of rape in this district. It grew to be two feet high. I cut and pulled some for my cows, and later on turned the cows on it. It yielded a good deal of feed, but cows prefer corn fodder.

Camden, Kent: The travelling dairy sent out by the Ontario Government visited our locality, and although there was not a very large attendance the visit will have a beneficial effect. I would also like to say a word regarding spraying fruit trees. Great Britain desires the choicest apples we can raise, but in order to have the best fruit we must kill the insect, and spraying seems to be the only way of accomplishing this. I commenced to spray with a force pump sprayer immediately after the blossoms fell off, and as the season was wet I only sprayed twice; but the consequence was I had the best apples in this section. Very few were wormy, while my neighbors who did not spray had very wormy apples. I used a pound of Paris green to 300 gallons of water.

Harwich, Kent: There are a few small patches of tobacco raised. It seems to do well in this locality.

Raleigh, Kent: Canada thistles have been getting more troublesome every year. The pathmasters have been in charge of the destruction of thistles, but so far with unfavorable results, but this year the council proposes to appoint five paid inspectors with full powers, which it is expected will have more effect than in the case of the unpaid pathmasters.

Plympton, Lambton: Since binders came into use farmers have not been sufficiently attentive in trying to exterminate Canada thistles as was the case when binding had to be done by hand. I have heard of some farmers who have had to shock their grain in the field with a pitchfork, or else use leather gloves to handle it.

Plympton, Lambton: Changes are being introduced. Knowledge is spreading. Land is being underdrained. The best machinery only can obtain a purchaser. New varieties of grain, etc., are being introduced. Agricultural meetings and institutes are making their influence felt, and it is becoming much more difficult in this locality to fool the farmer with any humbug in either machinery or seed grain.

Tuckersmith, Huron: Lucerne is beginning to be cultivated here to a small extent, but most farmers make a very great mistake by sowing a small quantity mixed with other clovers or grass seeds. To be suc-

cesful in the cultivation of lucerne the subsoil should be open, the land fallowed or made perfectly clean and abundance of seed should be sown without any mixture of any other grasses or clovers. Grown in this way it is a most valuable crop for feeding hogs cheaply in summer.

Sunnidale, Simcoe: Many farmers are going a great deal more into seeding down and stock raising, which, I think, is an improvement in the right direction, for it keeps up the farmer and keeps down the weeds.

Oxford East, Oxford: I think that too many farmers try to work too much land for the amount of farm help they can get and pay. I am quite satisfied that some of the men in this neighborhood who farm from fifty to one hundred acres realize much better from the capital invested than others who are working larger farms.

Dereham, Oxford: There is great need of practical farm help. A good faithful man with a knowledge of farming cannot be obtained. Nearly all farmers have the usual number of hands, but they are usually all young men from sixteen to twenty years of age, or old-country men who know nothing about farming, and are not very willing to learn. In a word, there is a lack of good, faithful, intelligent farm work.

Guelph, Wellington: The growing of rape is also an important factor in cleaning as well as enriching the land. The rape is eaten off the land by cattle and sheep—chiefly by sheep and lambs—and their droppings being chiefly distributed over the field have a splendid effect on the land. It should be lightly plowed in the fall after the rape is eaten off, in order to loosen the hard-tramped earth and to prevent the droppings from washing away with the spring and winter rains.

Grantham, Lincoln: The Farmers Institutes are waking the people up, and setting them thinking, and to trying to get out of the old rut. There is now more of the spirit of co-operation amongst our farmers.

Beverly, Wentworth: I think there is nothing better to clean land of thistles than to seed with rye in the fall, and pasture in the spring and fore part of the summer until time to sow rape. Then seed to rape and plow late in the fall and seed to barley the next spring, and seed with clover with the barley. The result of such a method will be pasture in early spring and late fall, milk for the dairy, fat lambs for the market, land enriched by the droppings, thistles exterminated to a great extent, a good crop of barley and a good catch of clover.

Saltfleet, Wentworth: Fruit is grown here to a considerable extent. Some 500 tons of grapes have been shipped from this station this fall, and there are vines enough planted to double the product in five years. Hundreds of acres have been set with plum trees during the last five years. We have large pear and peach orchards, and also large areas in small fruits. As many as 1,000 crates of strawberries have been shipped from Winona in a single day, and there have been shipments of 300 to 500 crates of raspberries daily for a week or two in the heart of the season.

Gwillimbury E., York: The old rail-worm fence has got to go. All new fences are built in some other style—some use straight post and rail, and others use post and wire. Some of our farmers have been induced to have hedges of the honey locust planted, but it is a new thing and farmers are shy about having anything to do with it until they see results.

Markham, York: As several of the farmers in this locality are building silos the root crop will not be so large as in previous years. Taking into consideration the difference in labor of cultivating and hoeing roots and growing corn this new move is in the farmer's favor, as the time to hoe turnips, carrots and mangels comes in one of the busiest seasons of the year.

Cramahe, Northumberland: Tomato culture, within the last two or three years, has grown to be quite an institution. Farmers raise all the way from two to thirty acres. A good crop will yield about 300 bushels to the acre. The tomatoes are taken to the canning factories at Lakeport and Brighton, for which the growers receive about 25 cents per bushel.

Hallowell, Prince Edward: A few are growing lucerne, and the results are quite profitable. It affords three good crops, and when not cut the second time the growth of pasture is luxuriant.

Sophiasburg, Prince Edward: Many are sowing peas for the seedhouses for the foreign market; and the canning industry is taking a large part of our farm products. This is better for our overworked soils than the raising of so much barley.

Bastard, Leeds and Grenville: Using clover meadows for pasture in this cold country in the fall deprives the root of any protection. I have learned this from observation of my own and my neighbors' meadows. It is a common practice to turn cows on to a clover meadow because it is a good producer of milk; but I have noticed that where this is done there is no clover the next year. We have found that where we let the after clover remain we seldom fail of the second good clover crop.

Finch, Stormont: Farmers in this locality are beginning to be greatly interested in the silo. Two years ago there was only one in the township, last year five were built, and this year there will be ten or twelve additional ones built. Farmers' Institute meetings have done much good in this line.

Hawkesbury E., Prescott: Hops used to be largely cultivated in this township, but of late years have been given up, with the exception of little plots for home consumption. The farmers around here are cultivating more corn and roots.

Plantagenet S., Prescott: The Government is doing a splendid work in supplying literature to the farmers—or rather to the members of Farmers' Institutes. I only wish all the farmers of the province were members.

Dummer, Peterborough: The want of sufficient underdraining is a great cause of late seeding, sickly plants and light crops. If something could be done to educate the farmers on this point the crop production of the country might be increased one-third more.

Plantagenet S., Prescott: Hops are grown to quite an extent on the high, sandy land in this township, and pay well. This year the crop came to from $180 to $200 per acre. There were about 100 acres in small yards of from three to thirteen acres, each of which realized more money than any other crop which could be grown on the same land and with the same expense.

Thurlow, Hastings: There is no very great change in the method of farming, except that more improved machinery is being introduced. There is a marked change, however, in the crop sown. A barley-growing district has been supplanted by a dairy and mixed crop district—wheat and peas predominating.

Watt, Muskoka: Not much flax is grown here, but it is a crop that does well. In a German settlement near here they grow some every season and convert it into linen by hand. Were there a possibility of disposing of the fibre I think it would be more grown.

STATISTICS OF

THE WEATHER AND THE CROPS

THE WEATHER.

TABLE I. Showing for each month the highest, lowest, mean highest, mean lowest, and mean temperature at the principal stations in Ontario in 1892; also the annual mean for each station.

	Temperature.	Sangeen.	Birnam.	London.	Woodstock.	Stony Creek.	Toronto.	Lindsay.	Gravenhurst.	Ottawa.	Rockliffe.
		°	°	°	°	°	°	°	°	°	°
January.	Highest	44.9	49.1	49.0	49.8	54.0	46.1	41.7	41.0	37.2	36.0
	Lowest	-5.4	-21.3	-26.2	-28.0	-19.0	-10.2	-26.0	-20.0	-24.2	-10.0
	Mean highest	26.9	25.3	26.9	27.2	30.8	27.6	25.1	23.8	20.5	20.2
	Mean lowest	12.1	10.1	9.6	5.9	15.0	11.3	4.2	3.8	2.4	-2.0
	Monthly mean	19.56	17.70	19.86	19.19	23.16	20.55	15.28	15.29	11.96	7.48
February.	Highest	43.9	40.3	42.0	43.0	42.0	39.1	42.5	45.1	43.5	46.0
	Lowest	-5.5	-7.8	-6.0	-8.0	0.0	-6.2	-14.2	-19.0	-16.8	-34.0
	Mean highest	32.9	30.9	32.9	32.5	33.5	31.0	28.1	28.6	24.9	26.2
	Mean lowest	15.5	18.4	18.6	15.2	21.9	17.5	9.0	7.8	6.9	3.4
	Monthly mean	22.46	24.69	26.14	25.03	27.77	25.25	18.99	19.25	16.87	13.00
March.	Highest	54.8	54.1	55.0	55.0	50.0	43.6	46.5	47.0	42.3	50.0
	Lowest	-3.0	-2.0	0.0	-1.0	7.0	5.3	-2.2	-6.4	-10.0	-15.0
	Mean highest	35.3	34.0	35.5	35.5	36.1	34.2	32.6	32.4	30.2	33.3
	Mean lowest	18.2	19.2	20.1	17.1	23.1	21.7	14.0	11.7	12.5	10.2
	Monthly mean	24.50	26.59	28.85	26.41	29.97	27.58	22.80	23.09	22.00	20.42
April.	Highest	74.5	71.7	71.0	74.0	71.0	71.6	71.4	63.0	66.4	70.0
	Lowest	14.1	17.0	19.1	15.0	22.0	20.2	14.9	14.0	14.6	4.0
	Mean highest	49.0	51.3	53.4	52.4	52.9	50.4	52.0	47.9	50.5	49.8
	Mean lowest	30.3	31.6	32.3	30.7	34.0	32.4	28.6	28.0	30.4	25.7
	Monthly mean	38.12	41.45	44.97	41.88	43.14	40.98	39.04	38.16	40.13	35.53
May.	Highest	80.0	82.2	84.0	85.0	76.0	75.0	82.8	82.0	78.5	81.0
	Lowest	31.1	32.3	30.3	31.0	34.0	35.1	29.6	29.0	31.0	24.0
	Mean highest	60.3	60.9	62.5	61.6	60.9	59.6	62.9	61.9	63.0	63.2
	Mean lowest	42.8	44.0	43.8	41.7	45.4	44.9	41.2	40.6	42.4	37.4
	Monthly mean	50.45	52.44	55.23	52.90	52.91	51.35	51.49	51.87	53.05	50.53
June.	Highest	89.0	89.1	90.0	91.4	93.0	85.9	91.2	89.0	90.3	95.0
	Lowest	47.2	45.1	48.0	46.5	48.0	48.1	46.5	40.0	45.8	35.0
	Mean highest	72.8	76.7	78.0	77.4	78.2	74.2	75.7	74.5	75.3	76.3
	Mean lowest	54.4	56.9	57.8	56.0	59.2	56.7	55.1	53.5	55.2	50.0
	Monthly mean	62.33	66.83	69.33	66.91	67.29	65.04	65.20	64.15	64.77	62.53
July.	Highest	89.0	93.3	93.0	92.0	97.0	93.5	90.7	90.5	96.6	92.0
	Lowest	42.1	42.8	42.5	41.0	44.0	44.0	38.1	41.0	44.5	36.0
	Mean highest	76.5	80.0	81.4	80.7	83.0	78.8	81.4	80.6	81.3	81.3
	Mean lowest	55.2	56.4	57.3	55.8	60.5	57.6	53.7	53.1	57.0	52.4
	Monthly mean	65.75	68.18	72.80	68.29	70.82	68.11	67.89	67.48	68.49	65.14
August.	Highest	90.8	93.3	93.0	92.5	97.0	91.5	89.5	95.0	87.5	90.0
	Lowest	42.2	45.0	41.0	43.0	50.0	50.1	48.7	41.0	46.5	40.0
	Mean highest	75.1	76.8	79.4	78.4	80.1	76.5	79.0	80.8	76.1	77.9
	Mean lowest	55.9	56.7	55.8	54.3	59.6	58.6	55.2	54.9	57.1	52.6
	Monthly mean	64.59	66.74	70.32	66.37	69.52	67.36	66.44	66.76	66.49	61.74
September.	Highest	83.9	82.5	81.0	84.0	85.0	79.7	83.6	83.0	82.5	82.0
	Lowest	35.0	37.2	35.0	37.0	42.0	41.6	34.3	33.0	33.5	30.0
	Mean highest	68.9	70.2	71.8	70.9	73.1	69.3	69.4	69.9	69.2	68.5
	Mean lowest	50.6	50.6	48.9	47.4	53.3	51.0	47.6	48.2	47.1	44.5
	Monthly mean	57.29	60.39	61.93	59.12	63.00	60.10	57.32	58.42	57.58	52.42
October.	Highest	71.0	71.4	74.0	72.5	76.0	73.0	71.0	70.0	70.2	72.0
	Lowest	28.6	29.0	27.5	28.0	32.0	29.9	28.1	27.0	26.9	24.0
	Mean highest	55.2	56.4	57.9	56.4	62.1	55.8	55.4	56.5	53.2	52.9
	Mean lowest	39.3	39.2	38.6	37.1	41.7	39.6	35.8	36.4	37.2	33.9
	Monthly mean	45.53	47.85	49.10	46.76	51.26	47.66	44.29	45.18	44.79	43.18
November.	Highest	50.2	59.0	60.0	58.5	62.0	52.4	53.8	52.0	58.0	48.0
	Lowest	15.1	16.0	10.2	10.0	18.0	14.3	11.0	12.0	13.2	5.0
	Mean highest	40.5	38.5	40.2	39.4	44.2	40.3	37.2	37.0	35.2	34.2
	Mean lowest	29.5	29.6	28.9	27.8	32.7	29.8	25.5	25.3	25.2	22.4
	Monthly mean	34.24	34.03	35.11	33.58	38.00	35.35	31.25	31.47	30.53	27.61
December.	Highest	43.4	44.0	48.0	43.6	50.0	42.4	39.2	39.0	36.8	34.0
	Lowest	1.1	-4.0	-14.2	0.1	-5.0	-8.4	-17.0	-18.0	-18.3	-22.0
	Mean highest	30.3	28.7	29.0	28.5	34.0	31.0	26.8	26.0	22.3	20.8
	Mean lowest	20.2	19.5	18.1	16.3	19.9	20.4	13.0	10.2	9.0	4.6
	Monthly mean	25.37	24.12	25.09	24.11	26.59	26.01	20.23	19.14	16.27	11.69
	Annual mean	43.52	44.25	46.56	44.21	46.95	44.61	41.69	41.69	41.08	37.36

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TABLE II. Showing for each month the annual average of the highest, lowest, mean highest, mean lowest, and mean temperature at the principal stations in Ontario derived from the eleven years 1882-93; also the average annual mean at each station for the same period.

	Temperature.	Saugeen.	Birnam.	London.	Woodstock.	Stony Creek.	Toronto.	Lindsay.	Gravenhurst.	Ottawa.	Rockliffe.
		°	°	°	°	°	°	°	°	°	°
January.	Highest	45.4	47.1	47.5	47.3	52.6	44.9	42.4	43.2	39.9	38 7
	Lowest	-9.3	-10 7	-9.8	14.8	-5.7	-9.4	-24.0	-28.2	-23.0	-34.5
	Mean highest	27.2	26.0	27.8	27.6	34.6	27.9	23.4	23.3	18.9	18.0
	Mean lowest	11.7	13.0	12.8	9.3	20.7	12.6	5.2	2.7	0.5	-6.6
	Monthly mean	19.78	19.47	21.33	19.99	23.13	20.85	14.63	14.05	10.38	6.17
February.	Highest	46.4	48.5	47.1	47.0	47.9	44.2	42.7	43.6	40.2	42.8
	Lowest	-8.6	-13 6	-9.5	-10.6	-4.7	-7.5	-16.9	-22.7	-22.3	-34.3
	Mean highest	28.6	28.2	30.0	30.0	36.3	29.7	26.5	26.2	21.6	21.8
	Mean lowest	11.9	13.5	13 5	11.1	22.6	13 9	6.1	4.5	2.1	-4.2
	Monthly mean	19.97	20.86	22.34	21.83	23.92	22.38	16.68	16.09	12.54	8.88
March.	Highest	50.0	54.6	53.2	53.0	54 4	49.6	47.2	47.0	44.3	47.6
	Lowest	-6 0	-8.0	-5.9	-6.7	2.3	1.1	-11.6	-16.6	-12.4	-25.2
	Mean highest	32.7	33.5	34.4	34.4	36.6	33.8	31.7	32.0	30 0	31.0
	Mean lowest	15.9	17.8	17 8	16.1	23.7	19 6	12.6	10.5	11.7	4.3
	Monthly mean	23.56	25.09	26 88	26.14	28.84	26.76	22.29	21.70	21.22	18.13
April.	Highest	74.0	78.2	76.6	76.6	78.1	70.1	74.5	69.2	72.9	73.4
	Lowest	12.9	14.5	17.7	15.6	23.0	20.7	12.4	9.2	12.5	3.9
	Mean highest	48.4	52.3	51.0	52.7	54.7	49.5	50.4	48.2	48.9	48.5
	Mean lowest	30.0	32.0	32.2	30.4	36.7	32.4	28.9	27.5	29.3	24.4
	Monthly mean	38.54	42.16	43.45	41.95	43.17	40.91	39.20	37.77	39.81	36.33
May.	Highest	78.8	82.7	80.8	80.6	81.9	75.9	81.8	81.9	81.2	84.6
	Lowest	27.5	27.7	30.3	28.4	35.6	31.5	27.3	26.6	29.6	23.5
	Mean highest	60.0	64.9	64.8	63.6	63.2	61.0	64.5	63.0	65.2	64.0
	Mean lowest	40.0	42.4	43.4	41.1	44.2	42.8	40.5	41.2	43.0	37.1
	Monthly mean	49.29	53.64	54.96	53.39	53.53	51.84	52.22	51.64	54.83	50.59
June.	Highest	85.8	87.8	86.6	87.9	90.4	84.8	89.0	88.4	88.4	89.7
	Lowest	37.6	36.9	40 0	35.6	45.2	42.8	38.0	36.6	40.6	33.7
	Mean highest	70.6	76.1	75.1	76.2	78.2	72.8	75 8	74.6	75.9	75.1
	Mean lowest	50.1	52.7	53.9	52.0	58.1	53.2	50.7	51.1	53.4	46.4
	Monthly mean	59.98	64.40	65.54	64.77	65.42	62.81	63.26	62.79	65.44	61.14
July.	Highest	86.8	90.8	89.5	89.5	94.0	88.5	90.4	88.7	90.3	90.6
	Lowest	41.2	40.7	44.6	43.7	50.1	47.6	42.1	42.7	46.5	39.9
	Mean highest	74.1	79.5	78.2	79.1	81.4	77.0	79.2	77.7	78.6	77.5
	Mean lowest	54.0	55.0	56.2	54.4	59.4	57 2	53.4	54.7	56.8	52.1
	Monthly mean	63.72	67 28	68.57	67.76	70.04	67.20	66.14	66.12	68.33	64.18
August.	Highest	86.6	90.8	88.8	89.7	92.4	87.2	90.0	88.4	88.5	89.1
	Lowest	40.5	39.2	40.1	41.4	47.8	46.1	39.0	39.7	42.6	37.9
	Mean highest	73.2	76.6	75.7	77.0	78.6	74 8	76.5	75.3	75.5	74.6
	Mean lowest	53.8	53.4	54.0	52.5	58.7	56.4	52.0	52.9	54.2	50.3
	Monthly mean	62.73	65.00	65.82	64 93	68.05	65.49	63.61	63.43	65.45	60.93
September.	Highest	84.5	86.4	84.2	86.3	88 4	81.8	86.1	83.5	83.4	84.0
	Lowest	32.6	32.9	33.0	31.5	37.6	37.3	30.3	31.7	31.6	29.7
	Mean highest	67.8	70.5	69.6	70.4	73.7	68.0	69.4	68.9	68.1	67.4
	Mean lowest	47.9	48.7	49.1	46.2	53.3	49.7	45.2	44.3	46.6	42.9
	Monthly mean	56.70	59.70	59.62	58.72	61.21	58.84	56.50	56.57	57.45	53.22
October.	Highest	78.1	75.8	73.6	74.5	74.9	71.0	75.9	72.0	69.5	72.3
	Lowest	22.6	23.0	23.5	22.0	26.1	25.4	19.4	20.9	22.0	17.3
	Mean highest	54.9	55.9	55.4	55 6	50.3	54.3	54.0	54 8	51.7	51.5
	Mean lowest	38.0	38.8	37.5	36.0	42.4	38.8	34.6	36.0	34.6	32.1
	Monthly mean	45.42	47.32	46.78	46.23	48.59	46.79	43 39	44.34	43.83	40.62
November.	Highest	60.7	63.5	62.2	62.3	65.2	58.9	60 4	60.4	58.6	55.7
	Lowest	11.8	13.0	13.1	9.7	16.2	12.9	3.2	5.9	4.5	2.9
	Mean highest	42.8	42.4	43.6	42.5	46.4	42.6	40.0	41.1	38.2	36.5
	Mean lowest	29.4	30.3	29 6	27.3	33.0	30.1	25.2	24.9	24.8	21.6
	Monthly mean	35.48	36.36	36.93	35.72	39.06	36.61	32.39	32.98	31.97	28 98
December.	Highest	49.1	48.9	50.2	47.9	52 9	46.3	43.8	45.0	41.8	42.4
	Lowest	-1.1	-2.2	-3.9	-5.3	3.1	-1.8	-14.2	-12.6	-15.6	23.7
	Mean highest	33.2	32.2	33.6	32.5	36.3	33.4	28.9	29.6	24 8	24.8
	Mean lowest	20.6	20.5	19.9	17.6	23.1	20.7	13.4	13.5	8.9	5.1
	Monthly mean	26.89	26.37	27.57	26.27	30.15	27.58	21.72	22.44	17.60	14.90
	Annual mean	41.84	43.97	44.98	43.98	46.26	44.01	41.00	40.85	40.74	37.01

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TABLE III. Monthly summary of bright sunshine at the principal stations in Ontario in 1892, showing the number of hours the sun was above the horizon, the hours of registered sunshine, the total for the year, and the average derived from the eleven years 1882-1892.

Stations.	January.	February.	March.	April.	May.	June.	July.	August	September.	October.	November.	December.	Total for the year.
	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.
Hours of sun above horizon.	285 7	302.5	369.9	406.4	461.1	465.7	470.9	434.5	376.3	340.2	286.9	274.3	4474.4
Wood-stock.. 1892...	81.0	77.0	137.7	175.3	143.1	216.6	321.2	239.2	178.5	127.6	33.0	38.3	1768.5
Wood-stock.. 1882-92	62.3	78.8	135.8	190.1	201.1	238.1	273.7	230.6	199.4	126.8	66.7	56.0	1859.4
Toronto.. 1892...	89.5	109 8	181.0	224.8	162.9	217.5	313.5	234.2	248 0	162.5	46.2	64.5	2054.4
Toronto.. 1882-92	77.1	94.7	152.5	198.9	216.7	257.2	287.9	248.9	219.2	140.8	77.4	56.9	2028.2
Barrie... 1892..	64.2	72.9	170.6	228.0	160.1	142.0	302.3	217.7	215.6	130.9	30.8	39.9	1775.0
Barrie... 1882-92	53.9	66.4	131.0	173.3	193.4	218.6	258.0	214.2	158.4	98.5	46.7	37.3	1649.7
Lindsay . 1892...	69.4	107.7	187.6	234.7	180.2	203.8	329.7	224.9	232.1	145.9	25.6	65.2	2006.8
Lindsay . 1882-92	74.6	97.5	162.7	208.9	215.5	253.4	282.0	255.8	210.6	132.6	70.3	58.8	2022.7
Kingston 1892...	60.1	100 6	197.5	213.1	180.7	227.2	308.6	242.0	216.6	160.9	40.0	75.2	2022.5
Kingston 1882-92	65.8	99.1	159.1	195.6	213.3	241.7	271.3	245.8	202.1	128.9	73.8	68.6	1965.1
Average of five stations 1892...	72.8	93.6	174.9	215.2	165.4	201.4	315 1	231.6	218.2	145.6	35.1	56.6	1925.5
Average of five stations 1891..	62.6	89.8	139.0	190.7	229.6	245.5	249.2	217.3	231 0	160.1	69.3	89.7	1973.8
Average of five stations 1882 92	66.8	87.3	148.2	193.4	208.0	241.8	274.6	239.1	198.0	125.5	67.0	55 5	1905.2

The average possible sunshine for February 1882-92 was 294.4.

TABLE IV. Monthly summary of inches of rain and snow precipitation in the several districts of Ontario in 1892; also the average derived from the eleven years 1882-92.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total for the year.
West and southwest:	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Rain 1892...	0.38	1.66	0.81	1.60	5.82	5.56	2.54	3.23	4.21	1.91	2.08	0.93	30.73
Rain 1882-92	1.31	1.78	1.23	1.70	3.40	3.49	2.57	2.83	2.50	2.66	2.58	1.47	27.52
Snow..... 1892...	21.7	10.2	5.3	0.8	*	....	....	....	....	....	9.6	8.0	55.6
Snow..... 1882-92	16.4	10.7	10.5	3.0	0.1	.....	....	....	....	0.2	6.7	13.7	61.3
Northwest and north:													
Rain 1892...	0.79	0.14	0.18	1.12	2.65	3.76	3.20	4.73	4.50	2.77	1.76	0.49	26.09
Rain 1882-92	1.06	0.73	0.76	1.42	2.46	2 82	2.67	2.92	3.05	2.80	2.23	1.13	24.05
Snow..... 1892...	23.2	17.5	8.9	2.5	1.5	....	....	....	....	*	13.5	20.5	87.6
Snow..... 1882-92	28.0	21.6	14.9	3.8	0.6	.....	....	....	....	1.2	13.6	20.9	104.6
Centre:													
Rain 1892...	0.19	0.77	0.66	0.94	3.50	4.67	3.11	3.61	3.26	1.21	2.29	0.87	25.08
Rain 1882-92	1.28	1.32	1.08	1.54	2.61	3.23	2.42	2.60	2.46	2.25	2.44	1.39	24.62
Snow..... 1892...	21.7	17.3	5.6	0.1	*	.....	....	....	....	....	9.4	4.0	58.1
Snow..... 1882-92	18.3	12.4	10.3	2.8	0.1	.....	....	....	....	0.2	5.8	10.9	60.8
East and northeast:													
Rain 1892...	0.40	0.06	0.35	0.92	2.60	4.17	2.08	5.45	3.40	1.88	2.25	0.42	23 98
Rain 1882-92	1.00	0.82	0.95	1.36	2.43	2.89	2.93	2.97	2.54	2.05	2.07	1.06	23.07
Snow..... 1892...	20.0	22.0	11.0	0.7	.....	.....	....	....	....	*	10.8	14.1	78.6
Snow..... 1882-92	21.8	18.8	14.7	4.4	0.3	.....	....	....	....	0.4	8.9	13.8	83.1

* Not measurable.

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TABLE V. Summary of the total fall of rain and snow, and of the number of days on which rain or snow fell in Ontario during the years 1891 and 1892 at stations reporting for the whole year, and the average for the province.

Station.	Observer.	Rain.				Snow.			
		1891.		1892.		1891.		1892.	
		Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.
ESSEX:									
Cottam	W. E. Wagstaff	26 30	92	34.18	108	28.3	23	33.6	29
Pelee Island	J. Quick	26.07	45	41.86	46	35 0	8	27.0	12
KENT:									
Blenheim	W. R. Fellows	31.28	82	32.30	76	27.8	21	41.5	25
Dealtown	S. J. Pardo	29.40	106	34.90	109	15.3	20	21.6	30
Ridgetown	T. Scane	30.22	95	32.92	106	40.0	41	39.5	43
ELGIN:									
Cowal	S. Maccoll	29.44	78	26 37	73	33.3	30	47.0	31
Port Stanley	M. Payne	30.17	144	33.88	155	51.0	50	64.5	93
NORFOLK:									
Port Dover	J. L. Morgan	23.77	132	26.77	142	46.1	63	59.3	57
HALDIMAND:									
Decewsville	R. E. King	26.20	105	27.43	100	52.4	38	95.5	40
WELLAND:									
Niagara Falls, S.	E. Morden	31.21	97	29.30	101	39.9	24	70.7	34
LAMBTON:									
Birnam	J. S. Mellor	33.21	98	24.96	106	55.5	34	109.0	42
Sarnia	Wm. Mowbray	27.03	56	27.48	52	42.5	14	58.5	17
Thedford	Martin Wattson	33.02	87	28.03	98	53.0	32	81.5	38
Watford	D. Ross	33.66	63	36.06	84				
Wyoming	J. Osborne	29.14	80	32.68	87	18.0	10	36.5	19
HURON:									
Goderich, L. H.	R. Campbell	24.78	68	19.13	65	72.5	28	70.0	27
Sunshine	G. Hood	30.87	87	26.69	86	69.8	51	88.1	62
Zurich	G. Hess	36.73	94	28.04	76	49.3	29	73.0	47
BRUCE:									
Lucknow	M. Macdonald	31.91	105	25.86	121	72.2	70	111.1	85
North Bruce	J. B. Muir	30.43	96	29.12	114	39.9	49	52.3	73
Point Clark	J. Ray	31.74	51	29.48	54	22.0	6	54.0	29
Saugeen	Mrs. J. R. Stewart	27.26	116	28.06	127	106.4	77	138.0	93
GREY:									
Bognor	C. H. Heming	30.06	122	28.59	128	135.5	62	152.0	66
Durham	J. Gunn, M.D.	24.74	95	24.71	101	170.3	74	96.0	69
Owen Sound	John McLean	30.59	61	30.02	73	103.3	30	124.0	41
Presque Isle	J. McKenzie	36.21	86	37.49	98	95.0	38	125.5	51
SIMCOE:									
Barrie	J. J. Gillam	23.01	100	25.82	113	88.5	56	100.5	72
Coldwater	J. B. Lazonby	27.50	88	29.21	94	152.8	59	108.6	62
Orillia	H. A. Fitton	20.52	84	23.70	98	124.9	77	95.5	64
MIDDLESEX:									
Coldstream	Daniel Zavitz	36.32	91	31.71	102	41.0	22	106.0	40
London	J. S. Dewar	37.33	124	38.19	118	48.9	63	76.9	77
Wilton Grove	H. Anderson	26.81	63	31.33	87	35.0	26	44.0	21
OXFORD:									
Princeton	D. Beamer	25.14	95	26.46	86	41.4	24	47.0	26
Woodstock	J. I. Bates, B. A.	32.77	115	32.16	101	55.7	32	46.7	52
BRANT:									
Paris	John Kay	31.60	93	34.54	90	30.1	20	40.3	24
St. George	Dr. Kitchen	30.64	103	31.38	115	35.7	24	47.6	35
PERTH:									
St. Marys	J. Thomson	21.97	83	31.30	86	76.0	25	66.0	37
WELLINGTON:									
Elora	T. Connor	30.91	59	28.09	56	32.0	30	36.3	30
Guelph, O. A. C.	Prof. J. H. Panton.	26.47	103	24.92	102	53.2	62	27.2	53

TABLE V. THE WEATHER.—(*Continued.*)

Station.	Observer.	Rain.				Snow.			
		1891.		1892.		1891.		1892.	
		Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.
DUFFERIN:									
Orangeville	N. Gordon	28.38	67	21.84	59	80.2	32	66.6	30
WENTWORTH:									
Stony Creek	C. F. Van Wagner	33.66	81	29.09	86	40.2	24	54.0	23
HALTON:									
Georgetown	J. Barber, jr	25.40	132	25.22	127	77.0	70	49.8	82
YORK:									
Aurora	Rev. R. W. Amos	21.43	77	24.92	85	50.7	41	52.1	41
Scarborough	R. Martin	27.49	102	25.05	98	31.7	41	42.1	51
Sharon	J. D. Graham	26.14	109	24.17	110	63.0	49	73.3	71
Toronto	Observatory	26.74	125	25.28	134	47.8	70	42.2	83
PEEL:									
Alton	W. J. Dods	28.16	103	25.27	112	59.3	45	49.2	59
LEN'X & ADDINGTON									
Denbigh	J. Lane	22.65	56	24.14	68	74.1	29	87.1	37
FRONTENAC:									
Kingston	A. P. Knight	24.94	143	26.78	127	51.3	60	83.2	73
GLENGARRY:									
Alexandria	J. Smith, M. A	27.42	106	30.69	101	63.6	60	102.0	66
CARLETON:									
Ottawa	W. T. Ellis	30.40	124	23.10	115	75.0	48	106.0	70
RENFREW:									
Clontarf	A. Schultz	25.47	97	22.14	91	85.7	60	106.1	65
Rockliffe	C. McIntyre	23.21	99	21.63	67	98.5	53	78.5	59
LANARK:									
Oliver's Ferry	W. J. McLean	24.40	77	25.27	69	40.5	21	56.0	26
VICTORIA:									
Lindsay	Thomas Beall	24.93	116	23.40	119	95.4	74	92.0	67
PETERBOROUGH:									
Ennismore	John N. Telford	19.79	67	22.99	58	54.0	32	45.5	21
Norwood	Rev. J. Carmichael	21.76	70	25.12	80	63.0	24	103.0	29
Peterborough	T. Tellford	24.75	106	26.16	90	85.1	50	68.5	35
HALIBURTON:									
Haliburton	C. R. Stewart	21.55	95	26.52	92	61.8	60	60.9	57
HASTINGS:									
Bancroft	J. Cleak	22.44	82	31.25	82	100.2	54	110.3	48
Deseronto	J. Russell	31.57	93	26.11	82	53.4	36	61.4	42
Shannonville	John Kemp	21.09	60	18.65	47	47.0	18	76.0	26
MUSKOKA:									
Bala	E. B. Sutton	27.12	112	32.19	120	82.6	67	83.7	70
Beatrice	J. Hollingworth	30.66	94	31.41	95	98.9	47	91.3	55
Novar	C. J. Tisdall	28.92	94	31.47	101	102.0	71	90.1	69
Gravenhurst	T. M. Robinson	24.92	92	29.68	99	74.8	53	86.2	58
Burk's Falls	G. Whelpton	23.04	76	26.54	90	72.5	52	91.5	64
PARRY SOUND:									
Parry Sound	Rev. R. Mosely	26.51	116	28.92	129	95.1	54	149.3	88
Sprucedale	A. Kirkam	25.01	71	31.92	79	90.0	32	98.6	46
Uplands	P. Macdonald	27.93	87	29.81	104	106.4	80	95.9	88
ALGOMA:									
Cartier	Agent C. P. R	19.90	55	23.01	59	81.0	37	76.0	36
Port Arthur	W. P. Cook	17.56	79	16.06	76	29.6	44	26.8	34
Savanne	Agent C. P. R	22.29	57	20.79	48	82.0	43	59.0	37
White River	Agent C. P. R	14.43	80	12.51	78	21.0	82	8.2	97
Average for the Province		27.41	91	27.76	93	64.7	43	73.1	50

THE WEATHER.

TABLE VI. Comparative Meteorological Register for the seven years 1886-92, as recorded at Toronto Observatory, in Latitude 43° 39.4′ N, and Longitude 5h. 17m. 34.65s. W.

Register.	1892.	1891.	1890.	1889.	1888.	1887.	1886.
	°	°	°	°	°	°	°
Average temperature	44.61	45.87	45.02	45.44	42.70	44.14	43.71
Difference from average (52 years)	+ 0.45	+ 1.71	+ 0.86	+ 1.28	— 1.46	— 0.02	— 0.45
Thermic anomaly (Lat. 43° 40′)	— 6.41	— 5.15	— 6.00	— 5.58	— 8.32	— 6.88	— 7.31
Highest temperature	93.5	91.9	89.4	88.7	92.0	97.2	89.5
Lowest temperature	—10.2	— 2.0	— 2.7	—11.3	—16.1	—16.6	—22.8
Annual ranges	103.7	93.9	92.1	100.0	108.1	113.8	112.3
Average daily range	15.58	16.45	16.22	15.55	16.55	17.12	16.53
Greatest daily range	38.6	37.8	36.0	42.8	37.7	34.0	32.6
Average height of bar, at 32° Fah	29.6325	29.6385	29.6313	29.6177	29.6448	29.6329	29.6255
Difference from average (51 years)	+0.0138	+0.0198	+0.0126	—0.0010	+0.0261	+0.0142	+ .0068
Highest barometer	30.356	30.266	30.334	30.365	30.432	30.607	30.283
Lowest barometer	28.846	28 536	28.762	28.582	28.793	28.704	28.752
Annual ranges	1.510	1.730	1.572	1.783	1.639	1.903	1.531
Average humidity of the air	77	75	78	77	74	75	77
Difference from average	.....	— 2	+ 1	.....	— 3	— 2	.....
Average elasticity of aqueous vapor	0.272	0.267	0.272	0.271	0.243	0.261	0.260
Average temperature of dew point	42.5	42.0	42.5	42.4	39.5	41.4	41.3
Average of cloudiness	0.61	0.59	0.62	0.63	0.63	0.63	0.61
Difference from average (38 years)	— 0.01	— 0.03	.00	+ .01	+ .01	+ .01	— .01
Resultant direction of wind	N 54° W	N 57° W	N 48° W	N 63° W	N 59° W	N 46° W	N 56° W
" velocity of wind	1.81	1.63	1.80	2.04	2.67	1.92	2.13
Average velocity (miles per hour)	8.17	7.33	9.19	9.08	9.71	9.88	9.73
Difference from average (16 years)	*	.....	— 0.45	— 0.56	+ 0.07	+ 0.24	+ 0.09
Total amount of rain in inches	25.285	26.735	32.110	24.575	22.819	17.969	27.726
Difference from average (52 years)	—2.119	—0.669	+4.706	—2.829	—4.585	—9.435	+0.322
Number of days of rain	134	125	145	127	133	106	112
Total amount of snow in inches	42.2	47.8	52.6	66.5	34.6	77.9	73.5
Difference from average (49 years)	—27.16	—21.56	—16.76	— 2.86	—34.76	+ 8.54	+ 4.14
Number of days of snow	83	70	81	60	83	78	66
Number of fair days	165	193	159	187	175	203	196
Number of days completely clouded	57	60	68	79	58	76	74
Number of auroras observed	33	18	7	6	21	25	29
Possible to see aurora (No. of nights)	195	212	188	169	183	180	189
Number of thunder storms	40	19	21	24	23	22	26
Number of fogs	36	38	43	34	26	39	29
Number of hours of bright sunshine	2054.4	2065.4	1977.6	1909.2	2048.3	2063.5	2034.4
Difference from average (11 years)	+ 26.2	+ 37.2	— 50.6	—119.0	+ 20.1	+ 35.3	+ 6.2
Number of hours of possible sunshine	4474.4	4463.3	4463.3	4463.3	4474.4	4463.3	4463.3

* During the years 1891-92, the wind has been obtained from the records of the anemograph at the Island and the entries at observation hours, and no comparison has been made with the result of former years.

RURAL AREA.

TABLE VII. Showing by County Municipalities and groups of Counties the Rural Area of Ontario, as returned by municipal assessors for 1892.

Counties.	Acres of assessed land.			Acres cleared.		Acres. Woodland	Acres swamp or marsh.	Per cent. cleared.
	Resident.	Non-Resident.	Total occupied.	1892.	1891.			
Essex	416,424	12,876	429,300	223,320	216,029	189,030	16,950	52.0
Kent	548,645	18,719	567,364	321,661	311,605	221,085	24,618	56.7
Elgin	435,398	1,660	437,058	285,119	283,056	141,042	10,897	65.2
Norfolk	387,182	7,434	394,616	237,285	233,664	130,106	27,225	60.1
Haldimand	274,612	5,143	279,755	210,418	203,719	59,286	10,051	75.2
Welland	223,730	4,551	228,281	167,953	163,087	54,754	5,574	73.6
Totals	2,285,991	50,383	2,336,374	1,445,756	1,411,160	795,303	95,315	61.9
Lambton	638,607	23,187	661,794	323,615	318,722	268,684	69,495	48.9
Huron	790,286	8,399	798,685	576,639	569,017	131,617	90,429	72.2
Bruce	806,111	29,257	835,368	474,118	465,486	252,663	108,587	56.8
Totals	2,235,004	60,843	2,295,847	1,374,372	1,353,225	652,964	268,511	59.9
Grey	1,037,739	23,768	1,061,507	579,596	567,705	298,283	183,628	54.6
Simcoe	917,441	44,944	962,385	503,974	497,338	395,031	63,380	52.4
Totals	1,955,180	68,712	2,023,892	1,083,570	1,065,043	693,314	247,008	53.5
Middlesex	749,935	7,550	757,485	535,601	532,110	202,277	19,607	70.7
Oxford	472,209	718	472,927	351,896	350,903	93,552	27,479	74.4
Brant	213,330	2,617	215,947	175,155	172,462	19,986	20,806	81.1
Perth	516,956	960	517,916	381,177	371,368	82,283	54,456	73.6
Wellington	624,041	3,062	627,103	451,781	441,646	90,460	84,862	72.0
Waterloo	302,756	4,150	306,906	240,567	244,156	47,349	18,990	78.4
Dufferin	346,235	10,650	356,885	204,708	202,389	72,166	80,011	57.4
Totals	3,225,462	29,707	3,255,169	2,340,885	2,315,034	608,073	306,211	71.9
Lincoln	186,097	4,926	191,023	155,200	152,227	33,858	1,965	81.2
Wentworth	270,521	1,249	271,770	207,493	209,074	41,997	22,280	76.3
Halton	221,025	3,610	224,635	166,256	168,246	41,577	16,802	74 0
Peel	288,226	108	288,334	241,862	239,241	33,268	13,204	83.9
York	527,482	7,843	535,325	419,875	415,537	66,075	49,375	78.4
Ontario	489,480	13,880	503,360	342,303	346,488	85,316	75,741	68.0
Durham	366,737	2,579	369,316	281,034	273,832	54,050	34,232	76.1
Northumberland	430,329	4,571	434,900	325,744	319,902	82,361	26,795	74.9
Prince Edward	221,943	6,563	228,506	186,119	182,287	31,883	10,504	81.5
Totals	3,001,840	45,329	3,047,169	2,325,886	2,306,834	470,385	250,898	76.3
Lennox & Addington	385,103	44,305	429,408	210,078	211,127	130,850	88,480	48.9
Frontenac	598,387	81,875	680,262	226,676	219,918	286,736	166,850	33.3
Leeds and Grenville	740,645	3,505	744,150	430,515	421,463	220,248	93,387	57.9
Dundas	235,480	2,350	237,830	137,274	135,259	60,247	40,309	57.7
Stormont	248,427	2,151	250,578	122,611	122,440	108,157	19,810	48.9
Glengarry	285,291	2,210	287,501	149,624	149,337	116,291	21,586	52.0
Prescott	268,547	19,010	287,557	149,900	142,885	119,029	18,628	52.1
Russell	241,777	10,783	252,560	80,390	79,422	170,237	1,933	31.8
Carleton	554,996	8,577	563,573	295,171	288,668	123,206	145,196	52.4
Renfrew	881,944	27,616	909,560	276,488	267,705	543,333	89,739	30.4
Lanark	644,502	23,459	667,961	295,310	304,127	238,102	134,549	44.2
Totals	5,085,099	225,841	5,310,940	2,374,037	2,342,351	2,116,436	820,467	44.7
Victoria	559,170	23,457	582,627	254,468	249,405	180,382	147,777	43.7
Peterborough	516,173	27,205	543,378	230,258	226,298	239,264	73,856	42.4
Haliburton	540,721	22,304	563,025	32,486	31,508	501,309	29,230	5.8
Hastings	914,109	65,794	979,903	350,695	336,737	483,220	145,988	35.8
Totals	2,530,173	138,760	2,668,933	867,907	843,948	1,404,175	396,851	32.5
Muskoka	457,376	59,814	517,190	55,551	54,721	380,458	81,181	10.7
Parry Sound	453,043	40,958	494,001	49,502	48,140	373,862	70,637	10.0
Nipissing	132,812	69,136	201,948	14,065	11,640	154,847	33,036	7.0
*Algoma	389,790	105,381	495,171	56,895	50,391	379,524	58,752	11.5
Totals	1,433,021	275,289	1,708,310	176,013	164,892	1,288,691	243,606	10.3
The Province.. 1892	21,751,770	894,864	22,646,634	11,988,426	.....	8,029,341	2,628,867	52.9
The Province.. 1891	21,589,562	946,421	22,535,983	.....	11,802,487	8,376,762	2,356,734	52.4

* Not including the acreages of the organized townships of Keewatin, Neebing, Shuniah and Macdonald and Meredith.

AREA AND PRODUCE—FALL WHEAT.

TABLE VIII. Showing by County Municipalities and groups of Counties the area and produce of Fall Wheat in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	44,161	644,751	14.6	37,930	952,043	25.1	32,931	643,677	19.5
Kent	72,175	1,342,455	18.6	62,322	1,639,069	26.3	60,696	1,219,794	20.1
Elgin	50,541	1,051,253	20.8	42,621	1,223,223	28 7	44,007	897,067	20.4
Norfolk	40,579	917,085	22.6	34,006	911,361	26.8	33,558	644,691	19.2
Haldimand	40,325	709,720	17.6	32,265	709,830	22.0	33,383	561,191	16.8
Welland	24,756	405,998	16.4	22,148	504,974	22.8	22,459	376,303	16.8
Totals	272,537	5,071,262	18.6	231,292	5,940,500	25.7	227,034	4,342,723	19.1
Lambton	45,529	842,287	18.5	40,642	1,081,077	26.6	36,018	707,935	19.7
Huron	61,867	1,385,821	22.4	55,265	1,519,788	27.5	63,882	1,307,318	20.5
Bruce	39,949	858,904	21.5	36,119	935,482	25.9	45,155	898,861	19.9
Totals	147,345	3,087,012	21.0	132,026	3,536,347	26.8	145,055	2,914,114	20.1
Grey	20,821	447,652	21.5	20,278	496,811	24.5	25,500	507,197	19.9
Simcoe	56,881	1,274,134	22.4	53,695	1,342,375	25.0	53,933	1,144,262	21.2
Totals	77,702	1,721,786	22.2	73,973	1,839,186	24.9	79,433	1,651,459	20.8
Middlesex	83,323	1,899,764	22.8	69,151	2,019,209	29.2	72,371	1,507,967	20.8
Oxford	43,850	1,034,860	23.6	38,359	1,104,739	28.8	38,893	823,892	21.2
Brant	32,331	772,711	23.9	26,912	745,462	27.7	28,941	574,444	19.8
Perth	40,857	923,368	22.6	36,113	1,072,556	29.7	42,797	884,881	20.7
Wellington	13,899	323,847	23.3	13,816	366,124	26.5	22,904	467,157	20.4
Waterloo	39,488	1,010,893	25.6	36,721	947,402	25.8	38,848	833,509	21.5
Dufferin	4,870	116,880	24.0	6,580	150,024	22.8	9,185	180,211	19.6
Totals	258,618	6,082,323	23.5	227,652	6,405,516	28.1	253,939	5,272,061	20.8
Lincoln	24,324	469,453	19.3	21,227	496,712	23.4	21,537	401,033	18.6
Wentworth	32,072	721,620	22.5	23,941	632,042	26.4	29,664	573,133	19.3
Halton	23,730	541,044	22.8	18,728	432,617	23.1	21,384	426,409	19.9
Peel	26,119	621,632	23.8	23,331	513,282	22.0	25,261	541,563	21.4
York	36,128	791,203	21.9	32,451	814,520	25.1	35,403	786,060	22.2
Ontario	8,096	180,541	22.3	5,560	142,892	25.7	8,598	191,430	22.3
Durham	5,115	101,277	19.8	4,641	110,456	23.8	3,889	80,224	20.6
Northumberland	17,148	349,819	20.4	13,998	254,764	18.2	12,074	242,539	20.1
Prince Edward	6,605	129,458	19.6	6,588	118,584	18.0	3,024	55,328	18.3
Totals	179,337	3,906,047	21.8	150,465	3,515,869	23.4	160,834	3,297,719	20.5
Lennox and Addington	2,808	57,564	20.5	4,839	83,231	17.2	2,449	43,702	17.8
Frontenac	922	19,823	21.5	1,244	22,516	18.1	1,552	28,942	18.6
Leeds and Grenville	2,384	50,302	21.1	3,001	50,417	16.8	4,479	82,149	18.3
Dundas	670	17,822	26.6	508	10,719	21.1	946	17,640	18.6
Stormont	145	3,422	23.6	98	2,450	25.0	522	9,602	18.4
Glengarry	188	4,418	23.5	195	3,413	17.5	479	7,987	16.7
Prescott	.....	.....	.....	.....	.....	.....	58	721	12.4
Russell	.....	.....	.....	42	1,126	26.8	175	3,124	17.9
Carleton	475	11,875	25.0	69	1,918	27.8	1,213	18,713	15.4
Renfrew	499	11,527	23.1	233	3,914	16.8	800	14,400	18.0
Lanark	1,280	30,848	24.1	1,966	34,405	17.5	2,823	53,599	19.0
Totals	9,371	207,601	22.2	12,195	214,109	17.6	15,496	280,579	18.1
Victoria	2,949	64,878	22.0	2,694	59,807	22.2	7,019	139,197	19.8
Peterborough	6,338	121,056	19.1	6,213	109,349	17.6	9,475	183,360	19.4
Haliburton	107	1,980	18.5	89	1,851	20.8	127	2,050	16.1
Hastings	11,510	210,633	18.3	12,757	236,005	18.5	9,652	185,668	19.2
Totals	20,904	398,547	19.1	21,753	407,012	18.7	26,273	510,275	19.4
Muskoka	32	512	16.0	27	432	16.0	58	1,005	17.3
Parry Sound	55	935	17.0	60	948	15.8	50	802	16.0
Nipissing	7	140	20.0	.....	.....	.....	2	38	19.0
Algoma	614	16,332	26.6	513	12,569	24.5	462	9,665	20.9
Totals	708	17,919	25.3	600	13,949	23.2	572	11,510	20.1
The Province	966,522	20,492,497	21.2	849,956	21,872,488	25.7	908,636	18,280,440	20.1

AREA AND PRODUCE—SPRING WHEAT.

TABLE IX. Showing by County Municipalities and groups of Counties the area and produce of Spring Wheat in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; a'so the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	1,369	12,047	8.8	1,916	34,680	18.1	1,666	24,719	14.8
Kent	4,542	51,779	11.4	4,079	76,277	18.7	3,667	56,619	15.4
Elgin	915	12,993	14.2	1,015	19,793	19.5	1,561	24,283	15.6
Norfolk	894	9,387	10.5	971	16,313	16.8	843	11,951	14.2
Haldimand	4,324	38,051	8.8	4,822	66,061	13.7	3,513	45,254	12.9
Welland	278	2,641	9.5	608	8,634	14.2	1,252	17,252	13.8
Totals	12,322	126,898	10.3	13,411	221,758	16.5	12,502	180,078	14.4
Lambton	6,511	60,552	9.3	5,959	119,180	20.0	6,295	91,577	14.5
Huron	19,344	288,226	14.9	11,642	259,617	22.3	16,313	231,793	14.2
Bruce	18,918	249,718	13.2	11,812	231,515	19.6	13,805	196,906	14.3
Totals	44,773	598,496	13.4	29,413	610,312	20.7	36,413	520,276	14.3
Grey	25,631	328,077	12.8	24,981	464,647	18.6	37,689	533,519	14.2
Simcoe	40,386	480,593	11.9	29,587	606,534	20.5	34,970	531,105	15.2
Totals	66,017	808,670	12.2	54,568	1,071,181	19.6	72,659	1,064,624	14.7
Middlesex	6,318	75,816	12.0	4,229	87,117	20.6	9,539	145,187	15.2
Oxford	5,982	66,998	11.2	5,845	126,252	21.6	8,598	138,969	16 2
Brant	1,393	16,577	11.9	918	17,442	19.0	1,203	16,934	14.1
Perth	14,752	194,726	13.2	10,504	243,693	23.2	12,232	186,425	15.2
Wellington	35,738	525,349	14.7	23,280	521,472	22.4	21,756	335,056	15.4
Waterloo	6,532	94,061	14.4	2,654	58,919	22.2	4,781	72,126	15.1
Dufferin	26,927	290,812	10.8	21,356	459,154	21.5	21,380	310,304	14.5
Totals	97,642	1,264,339	12.9	68,786	1,514,049	22.0	79,489	1,205,001	15.2
Lincoln	2,187	17,933	8.2	2,345	34,472	14.7	2,200	30,654	13.9
Wentworth	4,150	44,320	10.8	4,351	75,707	17.4	3,001	44,141	14.7
Halton	8,176	92,389	11.3	5,417	96,423	17.8	4,469	65,677	14.7
Peel	23,708	310,575	13.1	17,608	373,290	21.2	14,611	241,390	16.5
York	32,660	437,644	13.4	24,034	526,345	21.9	26,747	449,701	16.8
Ontario	51,657	526,901	10.2	49,256	1,113,186	22.6	47,582	794,955	16.7
Durham	35,312	300,152	8.5	31,623	657,758	20.8	35,990	567,794	15.8
Northumberland	30,044	297,436	9.9	23,166	410,038	17.7	27,415	374.555	13.7
Prince Edward	7,600	75,240	9.9	3,774	69,064	18.3	6,387	86,231	13.5
Totals	195,494	2,103,090	10.8	161,574	3,356,283	20.8	168,402	2,655,098	15.8
Lennox and Addington	5,487	66,941	12.2	2,841	52,274	18.4	5,641	81,133	14.4
Frontenac	9,266	139,917	15.1	8,473	177,086	20.9	8,747	133,374	15.2
Leeds and Grenville	13,378	200,670	15.0	9,242	206,097	22.3	12,825	204,445	15 9
Dundas	5,555	88,325	15.9	3,500	95,550	27.3	4,573	86,939	19.0
Stormont	5,103	81,138	15.9	3,388	80,634	23.8	4,435	79,983	18.0
Glengarry	8,464	138,810	16.4	7,641	164,282	21.5	7,926	131,765	16.6
Prescott	9,247	139,630	15.1	8,336	178,390	21.4	8,322	134,232	16 1
Russell	3,848	56,950	14.8	3,496	91,945	26.3	3,973	68,778	17.3
Carleton	26,886	483,948	18.0	22,510	679,802	30.2	22,327	405,628	18.2
Renfrew	29,260	558,866	19.1	22,187	463,708	20.9	24,686	419,919	17.0
Lanark	17,717	310,048	17.5	14,090	304,344	21.6	14,759	227,996	15.4
Totals	134,211	2,265,243	16.9	105,704	2,494,112	23.6	118,214	1,974,192	16.7
Victoria	44,272	451,574	10.2	30,340	628,038	20.7	33,004	486,729	14.7
Peterborough	31,374	320,015	10.2	30,573	513,626	16.8	26,608	356,319	13.4
Haliburton	1,854	23,731	12.8	1,652	28,084	17.0	1,436	19,089	13.3
Hastings	14,292	190,084	13.3	7,844	138,054	17.6	14,165	213,685	15.1
Totals	91,792	985,404	10.7	70,409	1,307,802	18.6	75,213	1,075,822	14.3
Muskoka	1,227	17,178	14.0	855	15,732	18.4	1,312	19,561	14.9
Parry Sound	1,264	16,053	12.7	910	14,196	15.6	1,330	20,829	15.7
Nipissing	343	6,174	18.0	286	5,148	18.0	81	1,368	16.9
Algoma	6,217	98,850	15.9	4,718	100,965	21.4	5,910	112,276	19.0
Totals	9,051	138,255	15.3	6,769	136,041	20.1	8,633	154,034	17.8
The Province	651,302	8,290,395	12.7	510,634	10,711,538	21.0	571,525	8,829,125	15.4

AREA AND PRODUCE—BARLEY.

TABLE X. Showing by County Municipalities and groups of Counties the area and produce of Barley in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	3,264	74,746	22.9	4,588	123,417	26.9	3,434	88,752	25.8
Kent	6,923	179,306	25.9	7,689	228,363	29.7	6,839	185,847	27.2
Elgin	5,691	129,186	22.7	5,392	167,691	31.1	4,938	132,315	26.8
Norfolk	2,877	62,719	21.8	4,967	125,665	25.3	5,762	145,735	25.3
Haldimand	7,411	143,773	19.4	8,015	130,645	16.3	13,028	284,485	21.8
Welland	2,915	59,758	20.5	3,120	81,120	26.0	3,656	84,774	23.2
Totals	29,081	649,488	22.3	33,771	856,901	25.4	37,657	921,908	24.5
Lambton	10,035	170,595	17.0	11,378	335,651	29.5	14,130	360,392	25.5
Huron	17,139	467,895	27.3	21,508	617,280	28.7	26,338	724,230	27.5
Bruce	10,627	297,556	28.0	12,747	372,212	29.2	17,759	465,688	26.2
Totals	37,801	936,046	24.8	45,633	1,325,143	29.0	58,227	1,550,310	26.6
Grey	13,948	359,858	25.8	12,833	361,891	28.2	20,843	517,304	24.8
Simcoe	31,018	812,672	26.2	27,291	821,459	30.1	30,929	808,220	26.1
Totals	44,966	1,172,530	26.1	40,124	1,183,350	29.5	51,772	1,325,524	25.6
Middlesex	11,585	262,980	22.7	13,728	418,704	30.5	14,894	394,351	26.5
Oxford	11,299	296,034	26.2	14,329	480,022	33.5	16,255	485,412	29.9
Brant	13,983	303,431	21.7	14,501	378,476	26.1	18,159	485,335	26.7
Perth	9,948	279,539	28.1	14,145	472,443	33.4	16,693	495,398	29.7
Wellington	25,428	689,099	27.1	28,976	915,642	31.6	34,219	972,305	28.4
Waterloo	14,202	453,044	31.9	17,859	562,559	31.5	16,862	519,709	30.8
Dufferin	9,806	245,150	25.0	11,115	315,666	28.4	11,740	301,161	25.7
Totals	96,251	2,529,277	26.3	114,653	3,543,512	30.9	128,822	3,653,671	28.4
Lincoln	2,433	59,122	24.3	3,098	66,607	21.5	4,147	100,993	24.4
Wentworth	9,399	233,095	24.8	10,925	266,570	24.4	12,734	344,505	27.1
Halton	6,922	178,588	25.8	8,790	225,024	25.6	12,224	338,579	27.7
Peel	20,938	573,701	27.4	27,431	757,096	27.6	33,631	924,365	27.5
York	39,163	1,057,401	27.0	43,812	1,423,890	32.5	54,378	1,574,395	29.0
Ontario	26,842	665,682	24.8	29,303	914,254	31.2	36,964	1,041,833	28.2
Durham	31,950	821,115	25.7	33,802	1,047,862	31.0	44,162	1,178,335	26.7
Northumberland	24,570	535,626	21.8	24,019	617,288	25.7	41,253	926,780	22.5
Prince Edward	21,761	428,692	19.7	22,525	540,600	24.0	36,932	765,235	20.7
Totals	183,978	4,553,022	24.7	203,705	5,859,191	28.8	276,425	7,195,020	26.0
Lennox and Addington	16,729	317,851	19.0	17,958	463,316	25.8	34,958	767,917	22.0
Frontenac	5,374	123,602	23.0	8,208	215,870	26.3	15,926	363,768	22.8
Leeds and Grenville	8,482	189,997	22.4	8,898	261,601	29.4	10,365	257,486	24.8
Dundas	4,015	91,542	22 8	4,866	155,712	32.0	6,214	180,315	29.0
Stormont	2,746	68,101	24.8	2,501	80,282	32.1	2,441	66,874	27.4
Glengarry	2,086	46,309	22.2	2,168	61,571	28.4	2,221	51,604	23.2
Prescott	4,579	92,496	20.2	3,913	116,607	29.8	3,244	84,090	25.9
Russell	1,885	40,339	21.4	2,221	72,405	32.6	1,634	41,193	25.2
Carleton	7,457	205,068	27.5	10,489	418,511	39.9	8,209	245,892	30.0
Renfrew	1,380	30,636	22.2	1,435	36,736	25.6	1,458	35,032	24.0
Lanark	3,660	87,108	23.8	2,834	87,854	31.0	2,984	77,867	26.1
Totals	58,393	1,293,049	22.1	65,491	1,970,465	30.1	89,654	2,172,038	24.2
Victoria	22,512	542,539	24.1	22,833	723,806	31.7	29,207	745,105	25.5
Peterborough	5,638	129,110	22.9	5,672	143,502	25.3	11,899	286,708	24.1
Haliburton	167	3,173	19.0	253	6,199	24.5	268	6,311	23.5
Hastings	17,558	395,055	22.5	18,575	468,090	25.2	35,175	803,039	22.8
Totals	45,875	1,069,877	23.3	47,333	1,341,597	28.3	76,549	1,841,163	24.1
Muskoka	692	13,494	19.5	635	15,621	24.6	558	12,069	21.6
Parry Sound	747	16,658	22.3	912	21,067	23.1	691	15,733	22.8
Nipissing	228	5,700	25.0	135	3,308	24.5	51	1,212	23.8
Algoma	1,213	35,177	29.0	774	21,749	28.1	656	17,518	26.7
Totals	2,880	71,029	24.7	2,456	61,745	25.1	1,956	46,532	23.8
The Province	499,225	12,274,318	24.6	555,166	16,141,904	29.2	721,062	18,706,166	25.9

AREA AND PRODUCE--OATS.

TABLE XI. Showing by County Municipalities and groups of Counties the area and produce of Oats in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	40,339	1,202,102	29.8	33,872	1,293,910	38.2	31,745	1,171,053	36.9
Kent	37,807	1,421,543	37.6	36,835	1,598,639	43.4	33,693	1,339,531	39.8
Elgin	31,432	958,676	30.5	32,085	1,366,821	42.6	32,498	1,208,403	37.2
Norfolk	26,331	797,829	30.3	25,557	971,166	38.0	26,700	854,487	32.0
Haldimand	24,191	672,510	27.8	24,026	627,079	26.1	23,227	729,246	31.4
Welland	19,083	473,258	24.8	19,901	712,456	35.8	19,723	605,709	30.7
Totals	179,183	5,525,918	30.8	172,276	6,570,071	38.1	167,586	5,908,429	35.3
Lambton	46,869	1,331,080	28.4	49,276	2,138,578	43.4	42,267	1,507,089	35.7
Huron	88,421	3,519,156	39.8	86,709	3,607,094	41.6	80,281	2,988,138	37.2
Bruce	70,391	2,632,623	37.4	73,615	2,716,394	36.9	63,136	2,098,189	33.2
Totals	205,681	7,482,859	36.4	209,600	8,462,066	40.4	185,684	6,593,416	35.5
Grey	104,194	3,813,500	36.6	105,102	3,825,713	36.4	91,754	2,990,138	32.6
Simcoe	79,389	2,873,882	36.2	72,886	2,951,883	40.5	66,704	2,322,529	34.8
Totals	183,583	6,687,382	36.4	177,988	6,777,596	38.1	158,458	5,312,667	33.5
Middlesex	75,456	2,573,050	34.1	75,316	3,276,246	43.5	73,794	2,798,909	37.9
Oxford	54,932	2,087,416	38 0	55,812	2,617,583	46.9	53,608	2,084,056	38.9
Brant	19,006	598,689	31.5	20,026	805,045	40.2	18,481	666,896	36.1
Perth	67,219	2,675,316	39.8	66,984	3,208,534	47.9	58,875	2,425,930	41.2
Wellington	72,895	2,850,195	39.1	87,511	3,780,475	43.2	73,698	2,764,724	37.5
Waterloo	44,461	1,765,102	39.7	42,414	1,853,492	43.7	37,297	1,422,951	38.2
Dufferin	39,142	1,514,795	38.7	39,244	1,534,440	39.1	31,634	1,104,215	34.9
Totals	373,111	14,064,563	37.7	387,307	17,075,815	44.1	347,387	13,267,681	38.2
Lincoln	18,420	653,910	35.5	18,899	587,759	31.1	17,968	590,443	32.9
Wentworth	26,078	912,730	35.0	27,935	1,047,563	37.5	28,500	1,027,028	36.0
Halton	22,068	812,102	36.8	21,918	846,035	38.6	19,577	709,325	36.2
Peel	32,200	1,310,540	40.7	35,855	1,620,646	45.2	30,561	1,169,195	38.3
York	72,400	2,975,640	41.1	74,071	3,614,665	48.8	65,416	2,667,989	40.8
Ontario	57,184	2,213,021	38.7	57,609	2,598,166	45.1	50,770	1,975,160	38.9
Durham	39,093	1,360,436	34.8	40,112	1,652,614	41.2	34,842	1,246,352	35.8
Northumberland	34,081	991,757	29.1	32,474	1,208,033	37.2	30,860	933,101	30.2
Prince Edward	15,134	394,997	26.1	14,902	524,550	35.2	13,834	391,796	28.3
Totals	316,658	11,625,133	36.7	323,775	13,700,031	42.3	292,328	10,710,389	36.6
Lennox and Addington	24,803	652,319	26.3	21,996	820,451	37.3	22,590	648,662	28.7
Frontenac	33,159	918,504	27.7	30,278	1,108,175	36.6	28,395	821,757	28.9
Leeds and Grenville	76,143	2,162,461	28.4	71,190	2,783,529	39.1	67,194	2,134,864	31.8
Dundas	33,696	1,172,621	34.8	30,245	1,336,829	44.2	29,991	1,075,258	35.9
Stormont	27,985	985,072	35.2	23,096	953,865	41.3	24,392	853,366	35.0
Glengarry	33,648	1,127,208	33.5	31,718	1,230,658	38.8	30,625	992,649	32.4
Prescott	32,321	982,558	30.4	27,581	1,039,804	37.7	27,083	849,886	31.4
Russell	19,690	590,700	30.0	19,972	858,796	43.0	18,738	614,161	32.8
Carleton	68,515	2,404,877	35.1	64,883	3,120,872	48.1	61,406	2,202,350	35.9
Renfrew	44,828	1,573,463	35.1	46,390	1,758,181	37.9	41,675	1,362,785	32.7
Lanark	45,396	1,534,385	33.8	42,500	1,793,500	42.2	38,354	1,234,768	32.2
Totals	440,184	14,104,168	32.0	409,849	16,804,660	41.0	390,443	12,790,506	32.8
Victoria	45,605	1,678,264	36.8	43,639	1,741,196	39.9	39,903	1,365,907	34.2
Peterborough	33,182	1,045,233	31.5	36,658	1,290,362	35.2	30,839	977,473	31.7
Haliburton	5,372	139,672	26.0	5,180	166,278	32.1	5,154	143,153	27.8
Hastings	46,259	1,336,885	28.9	45,367	1,537,941	33.9	42,655	1,270,820	29.8
Totals	130,418	4,200,054	32.2	130,844	4,735,777	36.2	118,551	3,757,353	31.7
Muskoka	11,178	334,222	29.9	10,285	335,291	32.6	9,232	271,400	29.4
Parry Sound	10,095	303,860	30.1	9,419	276,919	29.4	5,807	174,615	30.1
Nipissing	2,577	94,576	36.7	2,078	68,574	33.0	575	19,290	33.5
Algoma	8,801	335,318	38.1	7,215	202,742	28.1	5,178	181,898	35.1
Totals	32,651	1,067,976	32.7	28,997	883,526	30.5	20,792	647,203	31.1
The Province	1,861,469	64,758,053	34.8	1,840,636	75,009,542	40.8	1,681,229	58,987,644	35.1

AREA AND PRODUCE—RYE.

TABLE XII. Showing by County Municipalities and groups of Counties the area and produce of Rye in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	966	15,456	16.0	503	10,513	20.9	792	15,701	19.8
Kent	905	15,204	16.8	760	16,796	22.1	755	15,884	21.0
Elgin	2,302	31,768	13.8	610	11,773	19.3	1,339	23,329	17.4
Norfolk	5,519	80,026	14.5	4,999	81,484	16.3	7,281	101,563	13.9
Haldimand	1,136	17,381	15.3	353	4,695	13.3	797	12,715	16.0
Welland	395	6,004	15.2	388	7,256	18.7	576	9,880	17.2
Totals	11,223	165,839	14.8	7,613	132,517	17.4	11,540	179,072	15.5
Lambton	319	4,562	14.3	124	1,984	16.0	244	4,067	16.7
Huron	782	15,093	19.3	348	6,960	20.0	324	5,809	17.9
Bruce	346	4,394	12.7	588	10,996	18.7	461	8,275	18.0
Totals	1,447	24,049	16.6	1,060	19,940	18.8	1,029	18,151	17.6
Grey	405	7,290	18.0	515	9,270	18.0	553	9,651	17.5
Simcoe	986	16,269	16.5	1,831	34,240	18.7	2,198	39,484	18.0
Totals	1,391	23,559	16.9	2,346	43,510	18.5	2,751	49,135	17.9
Middlesex	553	11,060	20.0	396	8,158	20.6	511	9,073	17.8
Oxford	1,117	17,537	15.7	512	10,240	20.0	1,161	18,294	15.8
Brant	1,674	24,106	14.4	445	7,877	17.7	1,090	16,348	15.0
Perth	263	3,235	12.3	7	117	16.7	180	2,601	14.5
Wellington	1,352	23,930	17.7	639	11,310	17.7	854	15,188	17.8
Waterloo	530	11,130	21.0	322	6,826	21.2	514	9,175	17.9
Dufferin	198	4,613	23.3	315	6,300	20.0	628	11,314	18.0
Totals	5,687	95,611	16.8	2,636	50,828	19.3	4,938	81,993	16.6
Lincoln	319	6,444	20.2	78	1,451	18.6	390	6,151	15.8
Wentworth	433	7,101	16.4	692	12,733	18.4	904	15,386	17.0
Halton	827	12,736	15.4	564	11,562	20.5	559	9,310	16.7
Peel	1,508	23,374	15.5	469	7,316	15.6	1,225	23,298	19.0
York	1,116	17,633	15.8	758	14,857	19.6	1,538	25,768	16.8
Ontario	1,219	19,382	15.9	1,135	18,614	16.4	2,380	41,369	17.4
Durham	2,346	31,906	13.6	2,695	44,198	16.4	4,427	67,304	15.2
Northumberland	8,550	107,730	12.6	9,485	119,511	12.6	10,988	146,175	13.3
Prince Edward	5,034	75,510	15.0	5,378	85,510	15.9	8,235	116,594	14.2
Totals	21,352	301,816	14.1	21,254	315,752	14.9	30,646	451,355	14.7
Lennox and Addington	2,070	30,015	14.5	2,808	40,716	14.5	4,485	66,305	14.8
Frontenac	2,343	32,568	13.9	3,517	54,865	15.6	3,552	57,455	16.2
Leeds and Grenville	2,110	36,503	17.3	2,122	42,652	20.1	5,293	92,405	17.5
Dundas	861	19,373	22.5	584	13,841	23.7	1,213	27,429	22.6
Stormont	243	5,176	21.3	286	5,720	20.0	420	8,640	20.6
Glengarry	76	1,140	15.0				63	1,033	16.4
Prescott	68	1,428	21.0				213	3,940	18.5
Russell	275	5,308	19.3	453	11,325	25.0	257	5,322	20.7
Carleton	1,896	31,284	16.5	1,443	32,179	22.3	5,178	94,022	18.2
Renfrew	6,728	122,450	18.2	7,365	134,043	18.2	6,824	131,138	19.2
Lanark	1,720	32,164	18.7	2,710	1,490	19.0	4,110	76,641	18.6
Totals	18,390	317,409	17.3	21,288	386,831	18.2	31,608	564,330	17.9
Victoria	1,157	20,942	18.1	849	15,791	18.6	1,190	20,684	17.4
Peterborough	3,619	55,594	15.4	3,301	48,525	14.7	3,461	53,086	15.3
Haliburton	170	2,533	14.9	207	3,705	17.9	252	4,220	16.7
Hastings	7,653	104,081	13.6	6,508	101,525	15.6	12,513	193,001	15.4
Totals	12,590	183,150	14.5	10,865	169,546	15.6	17,416	270,991	15.6
Muskoka	231	3,396	14.7	122	2,367	19.4	348	6,486	18.6
Parry Sound	335	8,375	25.0	293	5,860	20.0	320	6,829	21.3
Nipissing	98	1,470	15.0	179	3,383	18.9	33	583	17.7
Algoma	329	7,830	23.8	209	4,096	19.6	228	4,222	18.5
Totals	993	21,071	21.2	803	15,706	19.6	929	18,120	19.5
The Province	73,073	1,132,504	15.5	67,865	1,134,630	16.7	100,857	1,633,147	16.2

AREA AND PRODUCE—PEAS.

TABLE XIII. Showing by County Municipalities and groups of Counties the area and produce of Peas in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882 92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	1,332	24,642	18.5	1,954	36,149	18.5	3,466	64,516	18 6
Kent	3,136	44,531	14.2	6,173	117,904	19.1	9,640	182,410	18.9
Elgin	13,548	170,705	12.6	14,822	366,103	24.7	13,227	239,245	18.1
Norfolk	21,191	347,532	16.4	20,485	450,670	22.0	16,720	319,033	19.1
Haldimand	15,654	214,460	13.7	17,451	251,294	14.4	14,272	248,730	17.4
Welland	4,521	71,884	15.9	5,049	87,853	17.4	4,354	73,237	16.8
Totals	59,382	873,754	14.7	65,934	1,309,973	19.9	61,679	1,127,171	18.3
Lambton	6,827	83,289	12.2	9,964	214,226	21.5	9,776	179,471	18.4
Huron	42,552	914,868	21.5	41,424	1,126,733	27.2	34,669	781,633	22.5
Bruce	45,376	971,046	21.7	46,946	1,258,153	26.8	39,190	896,921	22.9
Totals	94,755	1,969,203	20.1	98,334	2,599,112	26.4	83,635	1,858,025	22.2
Grey	52,154	886,618	17.0	52,323	1,302,843	24.9	47,115	1,004,633	21.3
Simcoe	42,961	932,254	21.7	38,840	994,304	25.6	33,655	734,569	21.8
Totals	95,115	1,818,872	19.1	91,163	2,297,147	25.2	80,770	1,739,202	21.5
Middlesex	19,893	244,684	12.3	24,689	632,038	25 6	22,657	433,190	19.1
Oxford	19,294	289,410	15.0	19,555	510,386	26.1	16,500	341,693	20.7
Brant	12,138	205,227	16.5	12,664	300,137	23.7	9,793	196,676	20.1
Perth	27,585	474,462	17.2	25,862	739,653	28.6	24,117	537,271	22.3
Wellington	39,528	747,079	18.9	37,645	937,361	24.9	37.924	845,625	22.3
Waterloo	18,723	451,224	24.1	18,697	501,079	26.8	15.498	353,869	22.8
Dufferin	17,521	322,386	18.4	16,037	356,021	22.2	12,837	266,241	20.7
Totals	154,982	2,734,472	17.6	155,149	3,976,675	25.6	139,326	2,974,565	21.3
Lincoln	6,116	125,378	20.5	6,406	94,809	14.8	5,203	92,789	17.8
Wentworth	11,351	205,453	18.1	12,642	266,746	21.1	11,127	223,311	20.1
Halton	11,387	210,660	18.5	11,339	253,994	22.4	10,766	226,406	21.0
Peel	19,141	426,844	22.3	16,976	370,077	21.8	14,948	311,951	20.9
York	36,643	696,217	19.0	32,036	797,696	24.9	29,730	654,610	22 0
Ontario	31,590	631,800	20.0	30,927	807,195	26.1	27,485	575,134	20.0
Durham	33,052	737,060	22.3	25,943	614,849	23.7	22,951	458,224	20.9
Northumberland	28,043	588,903	21.0	22,721	502,134	22.1	21,107	380,797	18.0
Prince Edward	21,201	404,939	19.1	20,449	474,417	23.2	14,817	275,478	18.6
Totals	198,524	4,027,254	20.3	179,439	4,181,917	23.3	158,134	3,198,700	20.2
Lennox and Addington	12,195	198,779	16.3	10,923	242,491	22.2	9,322	171,583	18.4
Frontenac	10,349	172,828	16.7	10,625	249,688	23.5	10,806	194,471	18.0
Leeds and Grenville	6,203	93,665	15.1	6,215	157,861	25.4	6,264	118,829	19.0
Dundas	1,359	19,570	14.4	1,555	41,985	27.0	1,633	34,853	21.3
Stormont	2,245	23,797	10.6	2,251	60,327	26.8	2,467	48,915	19.8
Glengarry	4,374	36,304	8.3	4,416	98,035	22.2	5,449	95,101	17.5
Prescott	5,670	39,123	6.9	6,063	166,126	27.4	8,106	131,925	16.3
Russell	3,035	28,226	9.3	2,726	66,242	24.3	3,583	67,589	18.9
Carleton	11,239	182,072	16.2	12,367	353,696	28.6	12,583	271,055	21.5
Renfrew	22,513	454,763	20.2	21,701	496,953	22.9	20,900	433,731	20.8
Lanark	13,152	224,899	17.1	11,785	320,552	27.2	11,569	245,805	21.2
Totals	92,334	1,474,026	16.0	90,627	2,253,956	24.9	92,682	1,813,857	19.6
Victoria	22,362	456,185	20.4	17,662	436,251	24.7	16,737	349,075	20.9
Peterborough	17,417	344,857	19.8	15,913	377,138	23.7	15,379	300,980	19.6
Haliburton	2,287	39,336	17.2	2,297	44,792	19.5	1,721	32,352	18.8
Hastings	21,925	401,228	18.3	20,788	476,045	22.9	19,028	348,504	18.3
Totals	63,991	1,241,606	19.4	56,660	1,334,226	23.5	52,865	1,030,911	19.5
Muskoka	4,209	70,711	16.8	4,187	104,675	25.0	3,056	63,419	20.8
Parry Sound	3,206	65,082	20.3	3,365	75,040	22.3	1,786	37,617	21.1
Nipissing	821	17,816	21.7	725	16,240	22.4	204	4,412	21.6
Algoma	7,413	201,634	27.2	6,870	174,498	25.4	4,441	114,031	25.7
Totals	15,649	355,243	22.7	15,147	370,453	24.5	9,487	219,479	23.1
The Province	774,732	14,494,430	18.7	752,453	18,323,459	24.4	678,578	13,961,910	20.6

AREA AND PRODUCE—CORN.

TABLE XIV. Showing by County Municipalities and groups of Counties the area, produce and yield per acre of Corn for husking and for silo and fodder for the year 1892, also the total acreage for 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	For husking.			For silo and fodder.			Total area.		
	Acres.	Bushels in ear.	Bush. per acre.	Acres.	Tons.	Tons per acre.	1892. Acres.	1891. Acres.	1882-92. Acres.
Essex	30,989	1,735,384	56.0	1,947	14,797	7.60	32,936	36,949	31,809
Kent	28,264	1,888,035	66.8	1,280	10,394	8.12	29,544	30,300	26,698
Elgin	13,500	828,900	61.4	1,887	14,436	7.65	15,387	14,625	14,599
Norfolk	11,966	805,312	67.3	1,761	18,209	10.34	13,727	12,272	13,972
Haldimand	1,322	68,347	51.7	638	3,828	6.00	1,960	1,155	1,998
Welland	4,802	290,041	60.4	922	7,865	8.53	5,724	5,736	6,292
Totals	90,843	5,616,019	61.8	8,435	69,529	8.24	99,278	101,037	95,368
Lambton	8,907	515,715	57.9	1,967	13,985	7.11	10,874	10,588	8,164
Huron	1,228	67,786	55.2	2,725	32,455	11.91	3,953	2,870	2,109
Bruce	471	26,517	56.3	1,749	23,996	13.72	2,220	1,860	956
Totals	10,606	610,018	57.5	6,441	70,436	10.94	17,047	15,318	11,229
Grey	649	32,450	50.0	2,380	25,942	10.90	3,029	1,567	960
Simcoe	1,063	72,816	68.5	2,454	36,810	15.00	3,517	1,558	1,175
Totals	1,712	105,266	61.5	4,834	62,752	12.98	6,546	3,125	2,135
Middlesex	9,919	633,824	63.9	4,240	37,821	8.92	14,159	12,732	11,634
Oxford	5,065	324,160	64.0	5,504	53,334	9.69	10,569	10,332	9,325
Brant	3,233	198,506	61.4	1,337	15,295	11.44	4,570	4,685	4,883
Perth	337	30,330	90.0	3,152	33,758	10.71	3,489	2,229	1,234
Wellington	385	23,100	60.0	2,153	26,697	12.40	2,538	1,348	937
Waterloo	659	50,809	77.1	1,284	14,252	11.10	1,943	1,795	1,478
Dufferin	329	16,450	50.0	90	1,215	13.50	419	256	145
Totals	19,927	1,277,179	64.1	17,760	182,372	10.27	37,687	33,377	29,636
Lincoln	6,097	431,058	70.7	913	7,003	7.67	7,010	6,262	6,449
Wentworth	2,863	206,995	72.3	4,357	47,012	10.79	7,220	5,337	4,964
Halton	775	46,500	60.0	1,599	11,193	7.00	2,374	2,015	1,425
Peel	377	15,080	40.0	2,006	19,258	9.60	2,383	1,184	806
York	745	42,838	57.5	2,728	22,724	8.33	3,473	2,957	1,881
Ontario	2,305	153,052	66.4	1,834	18,670	10.18	4,139	2,827	2,842
Durham	1,822	127,176	69.8	946	7,975	8.43	2,768	2,557	2,107
Northumberland	4,815	290,826	60.4	3,078	30,534	9.92	7,893	6,090	4,704
Prince Edward	6,689	357,862	53.5	1,769	15,196	8.59	8,458	7,022	6,720
Totals	26,488	1,671,387	63.1	19,230	179,565	9.34	45,718	36,251	31,898
Lennox and Addington	1,801	108,420	60.2	1,703	18,733	11.00	3,504	3,658	2,619
Frontenac	2,179	149,262	68.5	1,957	17,613	9.00	4,136	3,153	2,128
Leeds and Grenville	8,530	531,419	62.3	7,848	76,440	9.74	16,378	12,006	7,347
Dundas	2,500	145,750	58.3	2,447	27,235	11.13	4,947	4,478	2,253
Stormont	2,077	118,597	57.1	2,078	28,531	13.73	4,155	2,871	1,691
Glengarry	769	50,446	65.6	2,768	31,694	11.45	3,537	2,402	1,267
Prescott	2,371	145,579	61.4	765	9,494	12.41	3,136	2,486	1,593
Russell	411	25,359	61.7	1,431	21,937	15.33	1,842	1,398	674
Carleton	1,020	50,388	49.4	4,127	49,276	11.94	5,147	4,053	2,101
Renfrew	514	29,555	57.5	1,064	12,523	11.77	1,578	1,298	678
Lanark	1,388	71,898	51.8	2,257	26,791	11.87	3,645	2,767	1,756
Totals	23,560	1,426,673	60.6	28,445	320,267	11.26	52,005	40,570	24,107
Victoria	438	22,995	52.5	482	6,748	14.00	920	1,056	652
Peterborough	230	13,110	57.0	1,049	9,924	9.46	1,279	761	512
Haliburton	152	12,920	85.0	22	66	3.00	174	118	122
Hastings	7,124	455,936	64.0	4,525	45,748	10.11	11,649	8,943	6,840
Totals	7,944	504,961	63.6	6,078	62,486	10.28	14,022	10,878	8,126
Muskoka	218	9,745	44.7	72	528	7.33	290	266	228
Parry Sound	67	3,350	50.0	81	810	10.00	148	100	57
Nipissing	42	2,100	50.0	.....	.....	.....	42	73	14
Algoma	56	2,800	50.0	27	162	6.00	83	91	79
Totals	383	17,995	47.0	180	1,500	8.33	563	530	378
The Province	181,463	11,229,498	61.9	91,403	948,907	10.38	272,866	241,086	202,877

AREA AND PRODUCE—BUCKWHEAT.

TABLE XV. Showing by County Municipalities and groups of Counties the area and produce of Buckwheat in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	2,170	45,353	20.9	2,287	54,659	23.9	945	19,836	21.0
Kent	2,102	38,467	18.3	1,301	35,517	27.3	1,042	20,640	19.8
Elgin	2,839	60,755	21.4	2,094	51,303	24.5	1,547	30,420	19.7
Norfolk	5,522	101,053	18.3	4,500	109,350	24.3	4,825	86,833	18.0
Haldimand	557	8,912	16 0	667	13,007	19.5	718	11,889	16.6
Welland	2,027	33,851	16.7	3,161	89,772	28.4	1,904	35,692	18.7
Totals	15,217	288,391	19.0	14,010	353,608	25.2	10,981	205,310	18.7
Lambton	1,175	15,745	13.4	820	20,828	25.4	571	10,316	18.1
Huron	701	19,348	27.6	378	10,584	28.0	325	6,352	19.5
Bruce	738	20,147	27.3	639	15,528	24.3	440	7,934	18.0
Totals	2,614	55,240	21.1	1,837	46,940	25.6	1,336	24,602	18.4
Grey	881	21,144	24.0	687	13,259	19.3	439	7,704	17.5
Simcoe	2,204	50,692	23.0	860	16,082	18.7	587	10,920	18.6
Totals	3,085	71,836	23.3	1,547	29,341	19.0	1,026	18,624	18.2
Middlesex	1,001	19,520	19.5	406	10,272	25.3	558	9,661	17.3
Oxford	726	12,995	17.9	862	19,740	22.9	683	11,783	17.3
Brant	519	9,757	18.8	522	11,797	22.6	655	11,713	17.9
Perth	270	6,075	22.5	117	2,925	25.0	120	2,456	20.5
Wellington	241	5,423	22.5	410	7,913	19.3	209	4,384	21.0
Waterloo	711	10,665	15.0	185	3,811	20.6	162	2,693	16.6
Dufferin	94	1,880	20.0	279	6,975	25.0	111	2,189	19.7
Totals	3,562	66,315	18.6	2,781	63,433	22.8	2,498	44,879	18.0
Lincoln	1,216	21,037	17.3	919	23,802	25.9	792	15,669	19.8
Wentworth	994	22,961	23.1	625	17,438	27.9	788	15,581	19.8
Halton	378	8,505	22.5	110	2,464	22.4	184	2,892	15.7
Peel	345	4,830	14.0	347	8,675	25.0	277	4,498	16.2
York	438	10,205	23.3	568	13,518	23.8	304	6,015	19.8
Ontario	3,736	90,411	24.2	2,952	72,619	24.6	1,015	23,422	23.1
Durham	8,585	193,163	22.5	7,235	169,299	23.4	2,638	57,401	21.8
Northumberland	17,109	357,578	20.9	11,936	284,077	23.8	7,403	151,381	20.4
Prince Edward	15,837	300,903	19.0	10,103	229,338	22.7	7,749	161,476	20.8
Totals	48,638	1,009,593	20.8	34,795	821,230	23.6	21,150	438,335	20.7
Lennox and Addington	6,968	124,727	17.9	6,324	151,144	23.9	3,604	79,118	22.0
Frontenac	3,246	74,333	22.9	2,833	71,392	25.2	1,846	41,025	22.2
Leeds and Grenville	5,177	84,385	16 3	6,369	157,951	24.8	5,630	113,861	20.2
Dundas	1,424	33,179	23.3	2,860	74,646	26.1	1,668	41,749	25.0
Stormont	2,778	44,448	16.0	2,774	77,395	27.9	2,214	50,144	22.6
Glengarry	1,139	16,402	14.4	1,441	36,169	25.1	1,164	23,380	20.1
Prescott	1,631	25,770	15.8	1,884	42,955	22.8	1,624	30,222	18.6
Russell	687	13,740	20.0	1,500	43,350	28.9	990	22,182	22.4
Carleton	4,235	93,170	22.0	4,063	109,295	26.9	3,745	77,452	20.7
Renfrew	2,130	54,954	25.8	1,894	46,971	24.8	1,299	27,471	21.1
Lanark	6,162	110,916	18.0	4,791	125,524	26.2	5,581	112,461	20.2
Totals	35,577	676,024	19.0	36,733	936,792	25.5	29,365	619,065	21.1
Victoria	4,636	100,601	21.7	4,306	78,800	18.3	1,278	24,941	19.5
Peterborough	2,375	43,700	18.4	3,352	59,666	17.8	1,182	22,870	19.3
Haliburton	448	9,453	21.1	622	16,048	25.8	296	5,303	17.9
Hastings	7,887	173,514	22.0	6,582	169,816	25.8	4,550	96,092	21.1
Totals	15,346	327,268	21.3	14,862	324,330	21.8	7,306	149,206	20.4
Muskoka	358	9,057	25.3	616	16,694	27.1	352	8,353	23.7
Parry Sound	184	4,140	22.5	206	4,099	19.9	132	2,581	19.6
Nipissing	117	1,170	10.0	162	3,953	24.4	33	664	20.1
Algoma	406	12,180	30.0	330	7,722	23.4	130	2,946	22.7
Totals	1,065	26,547	24.9	1,314	32,468	24.7	647	14,544	22.5
The Province	125,104	2,521,214	20.2	107,879	2,608,142	24.2	74,309	1,514,565	20.4

AREA AND PRODUCE—BEANS.

TABLE XVI. Showing by County Municipalities and groups of Counties the area and produce of Beans in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	608	9,546	15.7	1,447	28,217	19.5	582	11,926	20.5
Kent	21,884	332,637	15.2	26,200	455,880	17.4	15,084	259,163	17.2
Elgin	1,406	23,621	16.8	3,347	67,944	20.3	1,430	27,265	19.1
Norfolk	362	6,769	18.7	132	2,785	21.1	619	8,317	13.4
Haldimand	448	7,168	16.0	151	3,050	20.2	201	3,273	16.3
Welland	661	8,990	13.6	1,429	24,293	17.0	829	10,835	13.1
Totals	25,369	388,731	15.3	32,706	582,169	17.8	18,745	320,779	17.1
Lambton	549	7,027	12.8	757	14,080	18.6	413	6,783	16.4
Huron	88	1,540	17 5	133	3,325	25.0	115	2,658	23.1
Bruce	45	900	20.0	134	3,685	27.5	108	1,906	17.6
Totals	682	9,467	13.9	1,024	21,090	20.6	636	11,347	17.8
Grey	143	3,575	25.0	167	3,758	22.5	137	2,405	17.6
Simcoe	120	2,400	20.0	140	3,024	21.6	113	1,974	17.5
Totals	263	5,975	22.7	307	6,782	22.1	250	4,379	17.5
Middlesex	373	6,975	18.7	343	7,066	20.6	339	5,619	16.6
Oxford	314	6,060	19.3	148	2,590	17.5	247	4,943	20.0
Brant	30	450	15.0	82	1,476	18.0	413	5,379	13.0
Perth	11	220	20.0	20	450	22.5	46	1,028	22.3
Wellington	56	1,120	20.0	17	340	20.0	40	666	16.7
Waterloo	28	560	20.0	8	160	20.0	39	623	16.0
Dufferin				99	2,079	21.0	25	488	19.5
Totals	812	15,385	18.9	717	14,161	19.7	1,149	18,746	16.3
Lincoln	126	1,688	13.4	192	3,763	19.6	166	3,018	18.2
Wentworth	42	840	20.0	197	4,098	20.8	161	2,916	18.1
Halton	10	200	20.0	7	175	25.0	35	583	16.7
Peel	44	880	20.0	24	480	20.0	51	1,090	21.4
York	104	1,955	18.8	134	3,189	23.8	134	2,925	21.8
Ontario	144	3,067	21.3	240	4,104	17.1	265	4,498	17.0
Durham	297	5,643	19.0	358	8,807	24.6	347	5,784	16.7
Northumberland	787	12,749	16.2	439	9,043	20.6	547	9,846	18.0
Prince Edward	399	8,379	21.0	247	4,026	16.3	420	8,036	19.1
Totals	1,953	35,401	18.1	1,838	37,685	20.5	2,126	38,696	18.2
Lennox and Addington	286	5,548	19.4	317	7,735	24.4	183	3,575	19.5
Frontenac	133	2,101	15.8	296	5,624	19.0	269	6,114	22.7
Leeds and Grenville	427	7,003	16.4	517	11,839	22.9	392	7,776	19.8
Dundas	204	3,550	17.4	290	7,192	24.8	247	5,474	22.2
Stormont	107	1,691	15.8	242	7,260	30.0	167	4,054	24.3
Glengarry	200	4,000	20.0	199	3,483	17.5	130	2,580	19.8
Prescott	349	5,549	15.9	786	18,392	23.4	509	11,522	22 6
Russell	130	2,275	17.5	196	4,096	20.9	198	3,764	19.0
Carleton	544	12,186	22.4	373	8,915	23.9	451	9,430	20.9
Renfrew	535	11,931	22.3	661	13,617	20.6	494	10,365	21.0
Lanark	142	2,698	19.0	268	6,084	22.7	216	4,639	21.5
Totals	3,057	58,532	19.1	4,145	94,237	22.7	3,256	69,293	21.3
Victoria	245	5,831	23.8	115	2,668	23.2	110	2,006	18.2
Peterborough	123	2,091	17.0	114	2,348	20.6	132	2,104	15.9
Haliburton	36	648	18.0	39	936	24.0	27	502	18.6
Hastings	552	11,095	20.1	291	4,365	15.0	321	5,930	18.5
Totals	956	19,665	20.6	559	10,317	18.5	590	10,542	17.9
Muskoka	37	555	15.0	41	820	20.0	43	761	17.7
Parry Sound	31	388	12.5	34	680	20.0	19	344	18.1
Nipissing	21	336	16.0	74	1,569	21.2	9	194	21.6
Algoma	68	1,496	22.0	6	90	15.0	18	360	20.0
Totals	157	2,775	17.7	155	3,159	20.4	89	1,659	18.6
The Province	33,249	535,931	16.1	41,451	769,600	18.6	26,841	475,441	17.7

AREA AND PRODUCE—HAY AND CLOVER.

TABLE XVII. Showing by County Municipalities and groups of Counties the area and produce of Hay in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Tons.	Tons. per acre.	Acres.	Tons.	Tons per acre.	Acres.	Tons.	Tons per acre.
Essex	33,846	49,754	1.47	42,934	53,668	1.25	36,734	57,020	1.55
Kent	50,893	89,063	1.75	56,594	62,253	1.10	51,809	79,722	1.54
Elgin	52,841	101,455	1.92	55,026	57,777	1.05	50,543	77,556	1.53
Norfolk	41,244	68,465	1.66	45,395	47,211	1.04	40,945	56,231	1.37
Haldimand	53,063	91,268	1.72	49,891	31,930	.64	49,638	65,005	1.31
Welland	46,750	84,618	1.81	48,393	45,490	.94	46,982	65,390	1.39
Totals	278,637	484,623	1.74	298,233	298,329	1.00	276,651	490,924	1.45
Lambton	70,224	124,296	1.77	65,622	78,090	1.19	56,196	83,833	1.49
Huron	113,160	211,609	1.87	111,653	100,487	.90	98,338	141,931	1.44
Bruce	102,418	176,158	1.72	100,347	67,233	.67	87,481	113,347	1.30
Totals	285,802	512,063	1.79	277,622	245,810	.89	242,015	339,111	1.40
Grey	133,039	234,149	1.76	129,539	117,880	.91	118,333	152,957	1.29
Simcoe	90,279	145,349	1.61	90,029	90,929	1.01	78,608	106,275	1.35
Totals	223,318	379,498	1.70	219,568	208,809	.95	196,942	259,232	1.32
Middlesex	100,236	181,427	1.81	96,480	117,706	1.22	90,839	141,511	1.56
Oxford	65,151	132,908	2.04	65,797	88,826	1.35	62,702	100,335	1.60
Brant	31,204	64,280	2.06	31,124	37,038	1.19	31,590	48,416	1.53
Perth	73,568	144,193	1.96	68,770	74,959	1.09	67,827	106,738	1.57
Wellington	89,319	175,065	1.96	93,080	99,596	1.07	84,276	130,194	1.54
Waterloo	42,779	88,125	2.06	43,046	36,159	.84	42,434	66,360	1.56
Dufferin	39,120	61,027	1.56	37,570	43,957	1.17	34,121	46,636	1.37
Totals	441,377	847,025	1.92	435,867	498,241	1.14	413,789	640,190	1.55
Lincoln	39,909	75,428	1.89	38,860	36,917	.95	40,533	56,268	1.39
Wentworth	47,172	104,250	2.21	46,666	42,933	.92	44,927	68,360	1.52
Halton	33,164	65,665	1.98	33,366	26,693	.80	33,258	46,472	1.40
Peel	39,752	75,926	1.91	43,236	43,236	1.00	38,106	55,869	1.47
York	82,267	158,775	1.93	88,559	93,873	1.06	73,911	106,014	1.43
Ontario	53,740	92,433	1.72	55,249	60,774	1.10	53,077	76,893	1.45
Durham	41,847	64,026	1.53	46,272	46,272	1.00	43,481	61,549	1 42
Northumberland	55,776	84,222	1.51	59,656	43,549	.73	54,031	68,592	1.27
Prince Edward	37,134	60,528	1.63	33,068	35,383	1.07	30,628	41,939	1.37
Totals	430,761	781,253	1.81	444,932	429,630	.97	411,952	581,956	1.41
Lennox and Addington	60,983	107,940	1.77	59,865	62,260	1.04	50,592	64,490	1.27
Frontenac	64,512	111,606	1.73	72,280	67,943	.94	63,015	78,753	1.25
Leeds and Grenville	113,912	207,320	1.82	118,329	81,647	.69	111,515	147,612	1.32
Dundas	36,451	72,902	2.00	38,894	36,949	.95	35,501	54,726	1.54
Stormont	31,972	47,958	1.50	34,042	34,042	1.00	32,487	48,486	1.49
Glengarry	38,875	66,476	1.71	39,546	25,705	.65	36,798	56,575	1.54
Prescott	41,372	67,850	1.64	43,590	51,436	1.18	34,276	49,155	1.43
Russell	21,256	37,198	1.75	20,061	21,866	1.09	18,387	24,899	1.35
Carleton	66,052	99,078	1.50	69,047	67,666	.98	60,139	79,242	1.32
Renfrew	64,503	80,629	1.25	69,642	48,053	.69	62,815	67,476	1.07
Lanark	74,242	121,757	1.64	61,597	49,278	.80	60,732	82,411	1.36
Totals	614,130	1,020,714	1.66	626,893	546,845	.87	566,257	753,825	1.33
Victoria	40,897	61,346	1.50	46,430	36,215	.78	38,822	46,053	1.19
Peterborough	42,163	59,871	1.42	46,514	30,234	.65	39,013	44,678	1.15
Haliburton	12,082	15,827	1.31	11,432	6,173	.54	10,261	10,602	1.03
Hastings	78,936	113,668	1.44	79,954	51,970	.65	69,740	86,840	1.25
Totals	174,078	250,712	1.44	184,330	124,592	.68	157,836	188,173	1.19
Muskoka	22,505	34,208	1.52	21,414	11,778	.55	20,872	25,287	1.21
Parry Sound	19,513	29,270	1.50	19,445	15,750	.81	11,474	13,242	1.15
Nipissing	5,239	7,859	1.50	4,446	3,023	.68	1,308	1,737	1.33
Algoma	20,007	37,613	1.88	17,225	9,991	.58	11,842	15,611	1.32
Totals	67,264	108,950	1.62	62,530	40,542	.65	45,496	55,877	1.23
The Province	2,515,367	4,384,838	1.74	2,549,975	2,392,798	.94	2,310,938	3,219,288	1.39

AREA AND PRODUCE—POTATOES.

TABLE XVIII. Showing by County Municipalities and groups of Counties the area and produce of Potatoes in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	3,348	192,845	57.6	2,685	257,492	95.9	2,814	273,344	97.1
Kent	2,770	211,905	76.5	3,471	447,065	128.8	3,269	397,422	121.6
Elgin	2,506	151,362	60.4	2,609	371,261	142.3	2,766	277,670	100.4
Norfolk	2,898	210,105	72.5	2,733	337,252	123.4	3,268	328,036	100.4
Haldimand	1,198	63,254	52.8	1,046	104,809	100.2	1,415	146,782	103.7
Welland	2,195	165,503	75.4	1,974	208,652	105.7	2,315	215,189	93.0
Totals	14,915	994,974	66.7	14,518	1,726,531	118.9	15,847	1,638,443	103.4
Lambton	3,077	129,849	42.2	3,320	417,988	125.9	3,016	295,906	98.1
Huron	4,713	471,300	100.0	5,143	836,766	162.7	5,037	615,391	122.2
Bruce	4,105	342,768	83.5	4,938	857,237	173.6	4,704	564,350	117.8
Totals	11,895	943,917	79.4	13,401	2,111,991	157.6	12,757	1,465,647	114.9
Grey	6,344	502,445	79.2	6,853	1,087,571	158.7	6,830	862,740	126.3
Simcoe	7,343	740,174	100.8	8,017	1,224,196	152.7	6,965	890,146	127.8
Totals	13,687	1,242,619	90.8	14,870	2,311,767	155.5	13,795	1,752,886	127.1
Middlesex	4,126	205,062	49.7	5,545	865,575	156.1	5,466	577,515	105.7
Oxford	2,753	196,564	71.4	3,287	541,369	164.7	3,228	357,417	110.7
Brant	1,871	144,254	77.1	2,306	353,279	153.2	2,192	245,261	111.9
Perth	3,679	293,584	79.8	3,546	575,161	162.2	3,701	423,890	114.5
Wellington	5,381	575,767	107.0	5,808	908,371	156.4	5,848	725,713	124.1
Waterloo	3,004	288,384	96.0	2,699	411,598	152.5	2,890	349,916	121.1
Dufferin	3,150	316,260	100.4	3,720	595,944	160.2	3,183	442,419	139.0
Totals	23,964	2,019,875	84.3	26,911	4,251,297	158.0	26,508	3,122,131	117.8
Lincoln	1,550	110,980	71 6	1,732	222,042	128.2	1,857	181,524	97.7
Wentworth	3,302	284,302	86.1	4,332	615,577	142.1	3,616	422,779	116.9
Halton	1,392	99,250	71.3	1,619	191,528	118.3	1,582	173,090	109.4
Peel	3,006	269,338	89.6	3,500	425,250	121.5	2,977	313,354	105.3
York	6,284	573,101	91.2	7,520	1,049,040	139.5	7,492	801,224	106.9
Ontario	4,288	466,963	108.9	5,019	766,903	152.8	4,236	534,579	126.2
Durham	3,091	325,791	105.4	3,227	489,536	151.7	3,149	397,432	126.2
Northumberland	4,233	550,290	130.0	4,491	587,872	130.9	4,342	484,964	111.7
Prince Edward	2,225	135,058	60.7	2,018	268,798	133.2	2,361	219,233	92.9
Totals	29,371	2,815,073	95.8	33,458	4,616,546	138.0	31,612	3,528,179	111.6
Lennox and Addington	2,891	195,432	67.6	3,306	456,889	138.2	3,212	357,427	111.3
Frontenac	3,639	268,194	73.7	4,059	632,392	155.8	4,011	407,071	101.5
Leeds and Grenville	6,621	386,004	58.3	7,221	1,164,747	161.3	7,225	836,140	115.7
Dundas	2,170	106,330	49.0	2,478	436,128	176.0	2,400	329,071	137.1
Stormont	1,966	81,392	41.4	2,188	264,310	120.8	2,049	232,138	113.3
Glengarry	2,351	110,027	46.8	2,436	343,720	141.1	2,430	267,927	110.3
Prescott	2,508	135,432	54.0	2,472	462,511	187.1	2,397	309,268	129.0
Russell	1,271	80,454	63.3	1,648	246,541	149.6	1,489	155,578	104.5
Carleton	5,460	364,182	66.7	6,127	1,044,654	170.5	6,023	784,133	130.2
Renfrew	3,797	427,163	112.5	4,379	784,717	179.2	3,828	577,115	150.8
Lanark	3,767	385,741	102.4	3,726	612,927	164.5	3,583	498,248	139.1
Totals	36,441	2,540,351	69.7	40,040	6,449,536	161.1	38,647	4,754,116	123.0
Victoria	2,850	288,420	101.2	3,235	480,398	148.5	3,136	407,387	129.9
Peterborough	2,742	276,668	100.9	3,194	426,399	133.5	2,739	327,226	119.5
Haliburton	656	87,642	133.6	661	111,841	169.2	679	92,955	136.9
Hastings	5,026	468,423	93.2	5,436	771,912	142.0	5,681	673,506	118.6
Totals	11,274	1,121,153	99.4	12,526	1,790,550	142.9	12,235	1,501,074	122.7
Muskoka	1,325	156,880	118.4	1,430	242,385	169.5	1,359	187,097	137.7
Parry Sound	1,138	173,090	152.1	1,363	231,437	169.8	852	131,115	153.9
Nipissing	564	94,019	166.7	582	100,046	171.9	143	23,128	161.7
Algoma	1,129	187,866	166.4	1,119	223,800	200.0	808	141,334	174.9
Totals	4,156	611,855	147.2	4,494	797,668	177.5	3,162	482,674	152.6
The Province	145,703	12,289,817	84.3	160,218	24,055,886	150.1	154,563	18,245,150	118.0

AREA AND PRODUCE—MANGEL-WURZELS.

TABLE XIX. Showing by County Municipalities and groups of Counties the area and produce of Mangel-wurzels in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	486	201,204	414	273	91,182	334	229	91,590	400
Kent	314	122,460	390	457	229,871	503	316	131,291	415
Elgin	379	167,518	442	464	280,256	604	311	132,171	425
Norfolk	184	77,096	419	309	148,629	481	221	87,530	396
Haldimand	226	63,732	282	164	50,184	306	178	58,150	327
Welland	106	49,184	464	179	93,259	521	149	63,063	423
Totals	1,695	681,194	402	1,846	893,381	484	1,404	563,795	402
Lambton	357	155,295	435	625	331,875	531	411	169,379	412
Huron	1,878	989,706	527	1,834	1,028,874	561	1,608	754,479	469
Bruce	456	245,784	539	433	207,407	479	447	193,579	433
Totals	2,691	1,390,785	517	2,892	1,568,156	542	2,466	1,117,437	453
Grey	359	178,782	498	409	161,964	396	379	167,227	441
Simcoe	455	216,580	476	488	235,216	482	601	247,876	412
Totals	814	395,362	486	897	397,180	443	980	415,103	424
Middlesex	1,159	449,692	388	2,047	1,242,529	607	1,415	626,705	443
Oxford	1,170	580,320	496	1,708	1,006,012	589	1,292	616,235	477
Brant	345	144,555	419	408	257.040	630	359	179,557	500
Perth	2,029	854,209	421	2,027	1,029,716	508	1,741	820,019	471
Wellington	1,339	705,653	527	1,373	665,905	485	1,024	463,778	453
Waterloo	578	284,376	492	616	333,872	542	509	224,348	441
Dufferin	82	49,300	600	168	79,800	475	124	52,600	424
Totals	6,702	3,068,005	458	8,347	4,614,874	553	6,464	2,983,242	462
Lincoln	280	120,680	431	248	124,992	504	247	98,386	398
Wentworth	486	239,598	493	403	221,247	549	447	220,074	492
Halton	471	203,943	433	444	267,732	603	440	206,246	469
Peel	625	324,375	519	405	168,075	415	466	189,371	406
York	1,796	858,488	478	1,588	747,948	471	1,744	796,912	457
Ontario	581	320,712	552	727	363,500	500	761	351,496	462
Durham	874	465,842	533	399	227,829	571	506	229,322	453
Northumberland	591	302,592	512	508	236,728	466	475	208,872	440
Prince Edward	151	52,850	350	137	41,100	300	127	37,596	296
Totals	5,855	2,889,080	493	4,859	2,399,151	494	5,213	2,338,275	449
Lennox and Addington	83	30,461	367	90	45,270	503	124	43,143	348
Frontenac	142	60,350	425	215	84,925	395	179	64,438	360
Leeds and Grenville	412	147,084	357	280	135,520	484	246	101,509	413
Dundas	156	74,880	480	156	103,116	661	112	48,693	435
Stormont	29	8,120	280	62	27,900	450	34	12,965	381
Glengarry	97	41,710	430	116	71,920	620	74	27,510	372
Prescott	118	42,834	363	53	24,115	455	86	32,186	374
Russell	217	73,780	340	142	65,746	463	92	34,005	370
Carleton	414	144,900	350	789	345,582	438	581	216,991	373
Renfrew	227	88,530	390	102	45,186	443	115	41,837	364
Lanark	213	90,099	423	161	69,391	431	149	60,246	404
Totals	2,108	802,748	381	2,166	1,018,671	470	1,792	683,523	381
Victoria	1,037	648,125	625	709	359,463	507	603	299,408	497
Peterborough	397	167,137	421	254	118,618	467	309	116,851	378
Haliburton	8	2,600	325	7	2,317	331	7	2,338	334
Hastings	626	272,936	436	902	378,840	420	452	160,010	354
Totals	2,068	1,090,798	527	1,872	859,238	459	1,371	578,607	422
Muskoka	46	15,502	337	52	17,108	329	50	13,589	272
Parry Sound	16	8,800	550	14	6,300	450	10	3,083	308
Nipissing	3	1,200	400	3	1,164	388	1	242	242
Algoma	28	7,000	250	13	4,225	325	21	5,961	284
Totals	93	32,502	349	82	28,797	351	82	22,875	279
The Province	22,026	10,350,474	470	22,961	11,779,448	513	19,772	8,702,857	440

AREA AND PRODUCE—CARROTS.

TABLE XX. Showing by County Municipalities and groups of Counties the area and produce of Carrots in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	100	24,300	243	105	28,455	271	91	23,034	253
Kent	147	42,483	289	179	69,273	387	156	45,847	294
Elgin	216	71,064	329	213	105,609	493	166	54,883	331
Norfolk	240	69,840	291	161	56,672	352	160	45,721	286
Haldimand	119	33,677	283	86	20,296	236	90	23,789	264
Welland	73	26,864	368	90	26,010	289	81	23,129	286
Totals	895	268,228	300	834	305,715	367	744	216,403	291
Lambton	247	59,774	242	233	82,482	354	205	60,648	296
Huron	292	112,128	384	480	202,080	421	479	187,207	391
Bruce	305	161,650	530	269	97,647	363	302	104,733	347
Totals	844	333,552	395	982	382,209	389	986	352,588	358
Grey	497	209,237	421	430	151,790	353	527	195,258	371
Simcoe	458	166,254	363	473	192,511	407	566	206,150	364
Totals	955	375,491	393	903	344,301	381	1,093	401,408	367
Middlesex	370	106,930	289	555	274,725	495	484	160,097	331
Oxford	208	94,224	453	313	151,492	484	338	137,196	406
Brant	100	35,600	356	143	66,638	466	196	82,165	419
Perth	243	87,480	360	270	122,580	454	394	152,749	388
Wellington	345	155,250	450	271	112,194	414	308	106,507	346
Waterloo	292	131,984	452	297	136,323	459	325	135,476	417
Dufferin	164	62,812	383	36	11,268	313	142	48,096	339
Totals	1,722	674,280	392	1,885	875,220	464	2,187	822,286	376
Lincoln	171	63,270	370	80	27,680	346	119	38,468	323
Wentworth	114	54,606	479	320	131,840	412	227	85,243	376
Halton	109	39,349	361	63	25,137	399	118	46,417	393
Peel	246	96,432	392	196	56,056	286	288	100,194	348
York	377	158,717	421	411	162,756	396	664	272,791	411
Ontario	287	121,401	423	269	108,676	404	469	183,501	391
Durham	366	178,974	489	244	104,920	430	475	180,309	380
Northumberland	337	139,518	414	238	79,968	336	278	96,744	348
Prince Edward	45	16,515	367	96	21,600	225	63	13,951	221
Totals	2,052	868,782	423	1,917	718,633	375	2,701	1,017,618	377
Lennox and Addington	46	11,362	247	57	20,634	362	58	16,587	286
Frontenac	136	51,680	380	287	98,728	344	175	46,716	267
Leeds and Grenville	294	112,602	383	329	105,609	321	198	63,864	323
Dundas	275	144,375	525	225	112,275	499	91	37,946	417
Stormont	57	16,986	298	52	19,084	367	45	12,713	283
Glengarry	113	35,030	310	115	37,950	330	56	14,976	267
Prescott	121	37,873	313	42	15,204	362	55	16,008	291
Russell	222	63,936	288	217	86,800	400	153	48,981	320
Carleton	374	114,818	307	545	197,290	362	559	181,808	325
Renfrew	267	85,707	321	145	47,995	331	122	37,889	311
Lanark	291	98,358	338	216	68,040	315	155	53,386	344
Totals	2,196	772,727	352	2,230	809,609	363	1,667	530,874	318
Victoria	187	95,744	512	225	90,000	400	284	107,068	377
Peterborough	573	269,883	471	346	123,176	356	359	124,126	346
Haliburton	9	2,817	313	43	12,814	298	21	6,331	301
Hastings	169	51,207	303	219	63,948	292	169	49,057	290
Totals	938	419,651	447	833	289,938	348	833	286,582	344
Muskoka	163	58,354	358	115	40,595	353	89	25,635	288
Parry Sound	92	31,096	338	100	29,700	297	41	11,347	277
Nipissing	16	4,800	300	3	960	320	3	705	235
Algoma	68	20,400	300	56	17,136	306	35	9,175	262
Totals	339	114,650	338	274	88,391	323	168	46,862	279
The Province	9,941	3,827,361	385	9,858	3,814,016	387	10,379	3,674,621	354

AREA AND PRODUCE—TURNIPS.

TABLE XXI. Showing by County Municipalities and groups of Counties the area and produce of Turnips in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92 also the yield per acre.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.	Acres.	Bushels.	Bush. per acre.
Essex	426	105,222	247	230	52,900	230	222	60,422	27
Kent	367	126,615	345	401	176,039	439	352	123,515	35
Elgin	401	134,335	335	421	225,235	535	366	130,843	35
Norfolk	1,551	578,523	373	1,362	644,226	473	1,075	410,225	38
Haldimand	130	42,640	328	159	52,152	328	123	36,348	29
Welland	220	73,260	333	143	54,483	381	174	58,077	33
Totals	3,095	1,060,595	343	2,716	1,205,035	444	2,312	819,430	35
Lambton	426	181,476	426	538	229,726	427	333	114,848	34
Huron	8,053	3,809,069	473	7,592	4,304,664	567	6,870	2,829,744	41
Bruce	7,774	4,633,304	596	7,006	3,755,216	536	5,919	2,541,183	42
Totals	16,253	8,623,849	531	15,136	8,289,606	548	13,122	5,485,775	41
Grey	10,231	4,890,418	478	10,546	5,905,760	560	9,231	3,879,087	42
Simcoe	5,866	2,721,824	464	4,636	2,679,608	578	3,694	1,592,287	43
Totals	16,097	7,612,242	473	15,182	8,585,368	565	12,925	5,471,374	42
Middlesex	2,168	904,056	417	1,468	904,288	616	1,719	658,286	38
Oxford	6,531	3,298,155	505	6,447	4,126,080	640	5,539	2,465,830	44
Brant	3,708	1,590,732	429	3,484	2,275,052	653	2,864	1,323,014	46
Perth	5,531	2,660,411	481	5,327	3,201,527	601	4,775	1,956,311	41
Wellington	13,303	6,984,075	525	13,468	8,148,140	605	12,995	5,745,550	44
Waterloo	5,739	3,012,975	525	5,146	2,825,154	549	5,121	2,133,732	41
Dufferin	3,453	1,647,081	477	3,074	1,718,366	559	2,543	1,030,743	40
Totals	40,433	20,097,485	497	38,414	23,198,607	604	35,556	15,313,466	43
Lincoln	282	108,570	385	256	112,384	439	239	84,989	35
Wentworth	2,757	1,557,705	565	2,932	1,700,560	580	2,528	1,221,616	48
Halton	1,937	825,225	425	2,071	1,168,044	564	1,751	785,595	44
Peel	1,637	826,685	505	2,056	1,003,328	488	1,420	562,342	39
York	4,987	2,279,059	457	5,053	2,587,136	512	3,634	1,491,675	41
Ontario	14,590	7,543,030	517	14,545	7,912,480	544	12,225	5,241,428	42
Durham	6,072	3,339,600	550	6,309	3,444,714	546	5,319	2,375,484	44
Northumberland	4,460	2,359,340	529	4,142	1,992,302	481	3,358	1,390,986	41
Prince Edward	69	27,600	400	127	48,260	380	112	27,942	24
Totals	36,791	18,864,814	513	37,491	19,969,208	533	30,586	13,182,057	43
Lennox and Addington	166	56,440	340	144	58,608	407	151	39,753	26
Frontenac	324	132,516	409	650	230,750	355	398	116,661	29
Leeds and Grenville	471	176,625	375	476	214,676	451	297	110,827	37
Dundas	66	34,650	525	60	29,520	492	65	21,088	32
Stormont	23	5,175	225	46	25,898	563	80	22,237	27
Glengarry	241	130,622	542	64	35,200	550	57	25,764	45
Prescott	214	75,756	354	180	90,720	504	124	47,354	38
Russell	605	277,090	458	534	257,922	483	356	147,618	41
Carleton	1,738	646,536	372	1,810	946,630	523	1,580	582,381	36
Renfrew	754	279,734	371	877	400,789	457	639	218,554	34
Lanark	725	292,175	403	677	328,345	485	513	191,854	37
Totals	5,327	2,107,319	396	5,518	2,619,058	475	4,260	1,524,091	35
Victoria	4,686	2,422,662	517	4,064	1,934,464	476	3,479	1,389,568	39
Peterborough	2,539	1,183,174	466	2,326	1,128,110	485	1,430	550,870	38
Haliburton	296	92,648	313	329	121,401	369	313	90,022	28
Hastings	1,338	496,398	371	1,312	494,624	377	927	279,594	30
Totals	8,859	4,194,882	474	8,031	3,678,599	458	6,149	2,310,054	37
Muskoka	851	311,466	366	1,087	418,495	385	968	310,987	32
Parry Sound	949	291,343	307	1,468	507,928	346	717	226,092	31
Nipissing	219	71,175	325	236	91,804	389	51	17,871	35
Algoma	753	306,471	407	796	289,744	364	541	189,207	35
Totals	2,772	980,455	354	3,587	1,307,971	365	2,277	744,157	32
The Province	129,627	63,541,641	490	126,075	68,853,452	546	107,187	44,850,404	41

RATIOS OF AVERAGE PRODUCTION.

TABLE XXII. Showing by County Municipalities and groups of Counties the per cent. ratios of total yields in 1892 to average of total yields for the eleven years 1882-92.

Counties.	Fall wheat.	Spring wheat.	Barley.	Oats.	Rye.	Peas.	Buckwheat.	Beans.	Hay and clover.	Potatoes.	Mangel-wuzzels.	Carrots.	Turnips.
Essex	100	49	84	103	98	38	229	80	87	71	220	105	174
Kent	110	91	96	106	96	24	186	128	112	53	93	93	103
Elgin	117	54	98	79	136	71	200	87	131	55	127	129	103
Norfolk	142	79	43	93	79	109	116	81	122	64	88	153	141
Haldimand	126	84	51	92	137	86	75	219	140	43	110	142	117
Welland	108	15	70	78	61	98	95	83	129	77	78	116	126
Group	117	70	70	94	93	78	140	121	121	61	121	124	129
Lambton	119	66	47	88	112	46	153	104	148	44	92	99	158
Huron	106	124	65	118	260	117	395	58	149	77	131	60	135
Bruce	96	127	64	125	53	108	254	47	155	62	127	154	182
Group	106	115	60	113	132	106	225	83	151	64	124	95	157
Grey	88	61	70	128	76	88	274	149	153	58	107	107	126
Simcoe	111	90	101	124	41	127	464	122	137	83	87	81	171
Group	104	76	88	126	48	105	386	136	146	71	95	94	139
Middlesex	126	52	67	92	122	56	202	124	128	35	72	67	137
Oxford	126	48	61	100	96	85	110	123	132	55	94	69	134
Brant	135	98	63	90	147	104	83	8	133	59	81	43	120
Perth	104	104	56	110	124	88	247	21	135	69	104	57	136
Wellington	69	157	71	103	158	88	124	168	134	79	152	146	122
Waterloo	121	130	87	124	121	128	396	90	133	82	127	97	141
Dufferin	65	94	81	137	41	121	86	....	131	71	94	131	160
Group	115	105	69	106	117	92	148	82	132	64	103	82	131
Lincoln	117	59	59	111	105	135	134	56	134	61	123	164	128
Wentworth	126	102	68	89	46	92	147	29	153	67	109	64	128
Halton	127	141	53	114	137	93	294	34	141	57	99	85	105
Peel	115	129	62	112	100	137	107	81	136	86	171	96	147
York	101	97	67	112	68	106	170	67	150	72	108	58	153
Ontario	94	66	64	112	47	110	386	68	120	87	91	66	144
Durham	126	53	70	109	47	161	337	98	104	82	203	99	141
Northumberland	144	79	58	106	74	155	236	129	123	113	145	144	170
Prince Edward	234	87	56	101	65	147	186	104	144	62	141	118	99
Group	118	79	63	109	67	126	230	91	134	80	124	85	143
Lennox and Addington	132	83	41	101	45	116	158	155	167	55	71	68	142
Frontenac	68	105	34	112	57	89	181	34	142	66	94	111	114
Leeds and Grenville	61	98	74	101	40	79	74	90	140	46	145	176	159
Dundas	101	102	51	109	71	56	79	65	133	32	154	380	164
Stormont	36	101	102	115	60	49	89	42	99	35	63	134	23
Glengarry	55	105	90	114	110	38	70	155	118	41	152	234	507
Prescott	....	104	110	116	36	30	85	48	138	44	133	237	160
Russell	....	83	98	96	100	42	62	60	149	52	217	131	188
Carleton	63	119	83	109	33	67	120	129	125	46	67	63	111
Renfrew	80	133	87	115	93	105	200	115	119	74	212	226	128
Lanark	58	136	112	124	42	91	99	58	148	77	150	184	152
Group	74	115	60	110	56	81	109	84	135	53	117	146	138
Victoria	47	93	73	123	101	131	403	291	133	71	216	89	174
Peterborough	66	90	45	107	105	115	191	99	134	85	143	217	215
Haliburton	97	124	50	98	60	122	178	129	119	94	111	44	103
Hastings	113	89	49	105	54	115	181	187	131	70	171	104	178
Group	78	92	58	112	68	120	219	187	133	75	189	146	182
Muskoka	51	88	112	123	52	111	108	73	135	84	114	228	100
Parry Sound	117	77	106	174	123	173	160	113	221	132	285	274	129
Nipissing	368	451	470	490	252	404	176	173	452	407	496	681	398
Algoma	169	88	201	184	185	177	413	416	241	133	117	222	162
Group	156	90	153	165	116	162	183	167	195	127	142	245	132
The Province	112	94	66	110	69	104	166	113	136	67	119	104	142

RATIOS OF AVERAGE YIELD PER ACRE.

TABLE XXIII. Showing by County Municipalities and groups of Counties the per cent. ratios average yields per acre in 1892, to average yields per acre for eleven years 1882-92.

Counties.	Fall wheat.	Spring wheat.	Barley.	Oats.	Rye.	Peas.	Buckwheat.	Beans.	Hay and clover.	Potatoes.	Mangel-wurzels.	Carrots.	Turnips
Essex	75	59	89	81	81	99	100	77	95	59	104	96	
Kent	93	74	95	94	80	75	92	88	114	63	94	98	
Elgin	102	91	85	82	79	70	109	88	125	60	104	99	
Norfolk	118	74	86	95	104	86	102	140	121	72	106	102	
Haldimand	105	68	89	89	96	79	96	98	131	51	86	107	11
Welland	98	69	88	81	88	95	89	104	130	81	110	129	10
Group	97	72	91	87	95	80	102	90	120	65	100	103	
Lambton	94	64	67	80	86	66	74	78	119	43	106	82	12
Huron	109	105	99	107	108	96	142	76	130	82	112	98	11
Bruce	108	92	107	113	71	95	152	114	132	71	124	153	13
Group	104	94	93	103	94	91	115	78	128	69	114	110	12
Grey	108	90	104	112	103	80	137	142	136	63	113	113	11
Simcoe	106	78	100	104	92	100	124	114	119	79	116	100	10
Group	107	83	102	109	94	89	128	130	129	71	115	107	11
Middlesex	110	79	86	90	112	64	113	113	116	47	88	87	10
Oxford	111	69	88	98	99	72	103	97	128	64	104	112	11
Brant	121	84	81	87	96	82	105	115	135	69	84	85	9
Perth	109	87	95	97	85	77	110	90	125	70	89	93	11
Wellington	114	95	95	104	99	85	107	120	127	86	116	130	11
Waterloo	119	95	104	104	117	106	90	125	132	79	112	108	12
Dufferin	122	74	97	111	129	89	102		114	72	142	113	11
Group	113	85	93	99	101	83	103	116	124	72	99	104	11
Lincoln	104	59	100	108	128	115	87	74	136	73	108	115	10
Wentworth	117	73	92	97	96	90	117	110	145	74	100	127	11
Halton	115	77	93	102	92	88	143	120	141	65	92	92	9
Peel	111	79	100	106	82	107	86	93	130	85	128	113	12
York	99	80	93	101	94	86	118	86	135	85	105	102	11
Ontario	100	66	88	99	81	96	105	125	119	86	119	108	12
Durham	96	54	96	97	89	112	103	114	108	84	118	129	12
Northumberland	101	72	97	96	95	117	102	90	119	116	116	119	12
Prince Edward	107	73	95	92	106	103	91	110	119	65	118	166	16
Group	106	68	95	100	96	100	100	99	128	86	110	112	11
Lennox and Addington	115	85	86	92	98	89	81	99	139	61	105	86	12
Frontenac	116	99	101	96	86	93	103	70	138	73	118	142	14
Leeds and Grenville	115	94	90	89	99	79	81	83	138	50	86	119	10
Dundas	143	84	79	97	100	68	93	78	130	36	110	126	16
Stormont	128	88	91	101	103	54	71	65	101	37	73	105	8
Glengarry	141	99	96	103	91	47	72	101	111	42	116	116	12
Prescott		94	78	97	114	42	85	70	115	42	97	108	9
Russell		86	85	91	93	49	89	92	130	61	92	90	11
Carleton	162	99	92	98	91	75	106	107	114	51	94	94	10
Renfrew	128	112	93	107	95	97	122	106	117	75	107	103	10
Lanark	127	114	91	105	101	81	89	88	121	74	105	98	10
Group	123	101	91	98	97	82	90	90	125	57	100	111	11
Victoria	111	69	95	108	104	98	111	131	126	78	126	136	13
Peterborough	98	76	95	99	101	101	95	107	123	84	111	136	12
Haliburton	115	96	81	94	89	91	118	97	127	98	97	104	10
Hastings	95	88	99	97	88	100	104	109	115	79	123	104	12
Group	98	75	97	102	93	99	104	115	121	81	125	130	12
Muskoka	92	94	90	102	79	81	107	85	126	86	124	124	11
Parry Sound	106	81	98	100	117	96	115	69	130	99	179	122	9
Nipissing	105	107	105	110	85	100	50	74	113	103	165	128	9
Algoma	127	84	109	109	129	106	132	110	142	95	88	115	11
Group	126	86	104	105	109	98	111	95	132	96	125	121	10
The Province	105	82	95	99	96	91	99	91	125	71	107	109	11

ACREAGE UNDER CROP; ALSO PASTURE AND ORCHARD.

TABLE XXIV. Showing by County Municipalities and groups of Counties in Ontario the total area under crop enumerated in Tables viii-xxi, for the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the area in Pasture and in Orchard and Garden for the same period.

Counties.	Area under crop.			Pasture.		Orchard and Garden.		
	1892.	1891.	1882-92.	1892.	1891.	1892.	1891.	1882-92.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Essex	165,351	167,673	147,460	30,535	30,720	6,965	6,521	6,127
Kent	233,509	236,761	214,016	51,021	57,607	9,822	9,048	7,776
Elgin	180,404	175,344	169,298	65,742	71,812	7,319	7,037	7,052
Norfolk	163,119	157,849	155,949	34,982	43,677	6,986	7,187	7,643
Haldimand	150,742	140,251	142,581	33,732	38,148	4,566	4,326	4,528
Welland	109,704	112,319	110,746	22,553	27,225	6,814	6,683	6,794
Totals	1,002,829	990,197	940,050	238,565	269,189	42,412	40,802	39,920
Lambton	203,019	199,846	178,039	79,181	87,526	7,378	6,850	6,456
Huron	362,943	346,979	336,688	147,948	172,246	8,921	9,181	8,563
Bruce	303,668	297,453	279,863	122,938	121,806	6,516	6,136	5,809
Totals	869,630	844,278	794,590	350,067	381,578	22,815	22,167	20,828
Grey	371,676	366,230	360,290	143,174	147,403	7,178	7,151	7,169
Simcoe	361,863	330,331	314,699	79,592	87,220	5,173	4,707	4,772
Totals	733,539	696,561	674,989	222,766	234,623	12,351	11,858	11,941
Middlesex	320,720	307,085	306,220	167,633	173,524	10,384	10,009	10,405
Oxford	223,896	223,306	218,369	82,489	89,539	7,900	8,070	8,313
Brant	123,172	118,220	120,819	26,725	28,718	3,882	3,463	4,328
Perth	249,444	235,921	234,732	83,833	84,157	4,997	4,847	4,852
Wellington	301,362	307,642	296,992	79,876	87,228	5,018	4,922	4,844
Waterloo	179,010	172,459	166,758	26,854	31,677	4,949	4,840	5,131
Dufferin	144,946	139,849	127,798	37,178	36,015	1,468	1,553	1,503
Totals	1,542,550	1,504,482	1,471,688	504,588	530,858	38,598	37,704	39,376
Lincoln	104,343	100,602	101,847	21,658	22,931	9,155	8,439	8,048
Wentworth	145,570	141,298	143,588	31,079	36,567	9,795	8,891	9,103
Halton	112,945	106,451	107,772	29,504	34,269	4,826	4,992	4,848
Peel	171,652	172,618	164,628	32,786	37,134	4,516	4,175	4,243
York	317,836	313,952	302,976	53,120	53,382	6,805	6,603	7,444
Ontario	258,093	255,618	248,669	54,631	58,986	5,319	5,042	5,238
Durham	210,768	205,417	204,283	43,738	40,229	3,436	2,986	3,691
Northumberland	233,622	213,363	218,835	60,976	66,039	6,752	6,543	6,480
Prince Edward	141,653	126,434	131,409	32,751	30,090	5,671	5,596	6,053
Totals	1,696,482	1,635,753	1,624,007	360,243	379,627	56,275	53,267	55,148
Lennox & Add'n.	139,019	135,126	139,988	53,549	59,352	2,607	2,850	2,745
Frontenac	137,681	146,118	140,999	65,504	55,565	1,818	1,889	2,141
Leeds & Grenville	252,392	246,195	239,270	134,000	136,910	2,479	2,789	3,047
Dundas	91,849	90,699	86,997	36,385	39,360	1,224	1,218	1,194
Stormont	79,554	73,897	73,444	38,125	40,803	446	1,026	937
Glengarry	95,389	92,457	88,739	44,289	45,565	666	618	593
Prescott	101,334	97,386	87,690	38,374	38,860	233	335	286
Russell	54,963	54,606	50,699	19,838	22,562	223	39	144
Carleton	200,432	198,568	186,095	72,721	74,851	887	256	540
Renfrew	178,999	178,309	166,333	62,133	66,308	281	203	485
Lanark	172,112	150,088	147,284	108,313	113,787	822	818	1,037
Totals	1,503,724	1,463,449	1,407,448	673,231	693,923	11,686	12,011	13,149
Victoria	194,315	178,157	175,424	39,068	48,149	2,002	1,750	1,773
Peterborough	149,750	155,191	143,337	48,125	57,285	2,000	1,915	1,939
Haliburton	23,666	22,929	20,684	6,064	6,889	109	117	103
Hastings	225,380	215,478	221,868	91,132	88,966	5,305	5,348	5,389
Totals	593,111	571,755	561,313	184,389	201,289	9,416	9,130	9,204
Muskoka	43,144	41,132	38,525	9,669	11,305	336	581	376
Parry Sound	37,773	37,689	23,286	7,553	8,295	32	41	29
Nipissing	10,295	8,982	2,508	1,813	2,055	.....	16	2
Algoma	47,129	39,935	30,349	9,156	8,539	177	255	164
Totals	138,341	127,738	94,668	28,191	30,194	545	893	571
The Province	8,080,206	7,834,213	7,568,753	2,562,040	2,721,281	194,098	187,832	190,137

RATIOS OF AREAS UNDER CROP.

TABLE XXV. Showing by County Municipalities and groups of Counties the number of acres under the various crops in Ontario in 1892 per 1,000 acres of cleared land.

Counties.	Fall wheat.	Spring wheat.	Barley.	Oats.	Rye.	Peas.	Corn.	Buckwheat.	Beans.	Hay and clover.	Potatoes.	Mangel-wurzels	Carrots.	Turnips.	Totals.
Essex	197.7	6.1	14.6	180.6	4 3	6.0	147.5	9.7	2.7	151.6	15.0	2.2	.5	1.9	740.4
Kent	224 4	14.1	21.5	117.5	2.8	9.8	91.9	6.5	68.0	158.2	8.6	1.0	.5	1.1	725.9
Elgin	177.3	3.3	20.0	110.2	8.1	47.5	54.0	9.9	4.9	185 3	8 8	1.3	.7	1.4	632.7
Norfolk	171.0	3.8	12.1	111.0	23.3	89.3	57 8	23.3	1.5	173.8	12.2	.8	1.0	6 5	687.4
Haldimand	191.6	20.6	35.2	115.0	5.4	74.4	9 3	2.6	2.1	252 2	5.7	1.1	.6	.6	716.4
Welland	147.4	1.7	17.4	113.6	2.4	26.9	34.1	12.1	3.9	278.3	13.1	.6	.4	1.3	653.2
Group	188.5	8.5	20.1	123.9	7.8	41.1	68.7	10.5	17.6	192.7	10.3	1.2	.6	2.1	693.6
Lambton	140 7	20 1	31.0	144.8	1.0	21.1	33 6	3.6	1.7	217.0	9.5	1.1	.8	1.3	627.3
Huron	107.3	33.5	29 7	153 3	1.4	73.8	6.9	1.2	.1	196.2	8.2	3.3	.5	14.0	629.4
Bruce	84.3	39.9	22.4	148.5	.7	95.7	4.7	1.5	.1	216.0	8.7	1.0	.6	16.4	640.5
Group	107.2	32.6	27.5	149.7	1.0	68.9	12.4	1.9	.5	207.9	8.7	2.0	.6	11.8	632.7
Grey	35 9	44 2	24.1	179.8	.7	90.0	5.2	1.5	.3	229.5	10.9	.6	.9	17.7	641.3
Simcoe	112.9	80.1	61.6	157.5	2.0	85.2	7.0	4 4	.2	179.1	14.6	.9	.9	11.6	718.0
Group	71.7	60.9	41.5	169.4	1.3	87.8	6.0	2.9	.2	206.1	12.6	.8	.9	14.9	677.0
Middlesex	155.6	11 8	21.6	140.9	1.0	37.1	26.4	1.9	.7	187.1	7.7	2.2	.7	4.1	598.8
Oxford	124.6	17.0	32.1	156.1	3.2	54.8	30.0	2 1	.9	185.2	7.8	3.3	.6	18.6	636 3
Brant	184.6	7.9	79.8	108 5	9 5	71.0	26.1	3.0	.2	178.1	10.7	2.0	.6	21.2	703 2
Perth	107.2	38.7	26.1	176.3	.7	72.4	9.2	.7	.0	193.0	9.7	5.3	.6	14.5	654.4
Wellington	30.8	79 1	56.3	161.4	3.0	87.5	5.6	.5	.1	197.7	11.9	3.0	.8	29.4	667.1
Waterloo	164.1	27.2	59.0	184.8	2.2	77.8	8.1	3.0	.1	177.8	12.5	2.4	1.2	23.9	744.1
Dufferin	23.8	131.5	47.9	191.2	1.0	85.6	2.0	.5	.0	191.1	15.4	.4	.8	16.9	708.1
Group	110.5	41.7	41.1	159.4	2.4	66 2	16.1	1 5	.4	188.6	10.2	2.9	.7	17.3	659.0
Lincoln	156.7	14.1	15.7	118.7	2.1	39.4	45.2	7.8	.8	257.1	10.0	1.8	1.1	1.8	672.3
Wentworth	154.6	20.0	45.3	125.7	2.1	54.7	34.8	4.8	.2	227.3	15.9	2.3	.6	13.3	701.6
Halton	142.7	49.2	41.6	132.7	5.0	68.5	14.3	2.3	.0	199.5	8 4	2.8	.7	11.6	679.3
Peel	108.0	98.0	86.6	133.1	6.2	79.1	9 9	1.4	.2	164.4	12.4	2.6	1.0	6.8	709.7
York	86.0	77.8	93 3	172.4	2.7	87.3	8.3	1.0	.2	195.9	15.0	4.3	.9	11.9	757.0
Ontario	23.7	150.9	78.4	167.1	3.6	92.3	12.1	10.9	.4	157.0	12.5	1.7	.8	42.6	754.0
Durham	18.2	125 7	113.7	139.1	8.3	117.6	9.9	30.5	1.1	148.9	11.0	3.1	1.3	21.6	750.0
Northumberland	52.7	92.2	75.4	104 6	26.3	86.1	24.2	52.5	2.4	171.2	13.0	1.8	1.1	13.7	717.2
Prince Edward	35.5	40.8	116.9	81.3	27.1	113.9	45.5	85.1	2.1	199.5	12.0	.8	.2	.4	761.1
Group	77.1	84.1	79.1	136.1	9.2	85.4	19.7	20.9	.8	185.2	12.6	2.5	.9	15.8	729.4
Lennox & Add'n	13.4	26.1	79.6	118.1	9.8	58.0	16.7	33.2	1.3	290.3	13.8	.4	.2	.8	661.7
Frontenac	4.1	40.9	23.7	146.3	10.3	45.7	18.2	14.3	.6	284.6	16.1	.6	.6	1.4	607.4
Leeds & Gren	5.5	31.1	19.7	176.9	4.9	14.4	38.0	12.0	1.0	264.6	15.4	1.0	.7	1.1	586.3
Dundas	4.9	40.5	29.2	245.5	6.3	9 9	36.0	10.4	1.5	265.5	15.8	1.1	2.0	.5	669.1
Stormont	1.2	41.6	22 4	228.2	2.0	18.3	33.9	22.6	.9	260.8	16 0	.2	.5	.2	648.3
Glengarry	1.3	56.6	13.9	224.9	.5	29.2	23.6	7.6	1.3	259.8	15.7	.7	.8	1.6	637.5
Prescott	.0	61.7	30.6	215.6	.5	37.8	20.9	10.9	2.3	276.0	16.7	.8	.8	1 4	676.0
Russell	.0	47 9	23 5	244.9	3.4	37.8	22.9	8 5	1.6	264.4	15.8	2.7	2.8	7.5	683.1
Carleton	1.6	91.1	25.3	252.1	6.4	38.1	17.4	14.3	1.8	223.8	18.5	1.4	1.3	5.9	679.0
Renfrew	1.8	105.8	5.0	162.1	24.4	81.4	5.7	7.7	2.0	233.3	13.7	.8	1.0	2.7	647.0
Lanark	4.3	60.0	12.4	153.7	5.8	44.5	12.3	20.9	.5	251.4	12.8	.7	1.0	2.5	582.0
Group	4.0	56.5	24.6	185.4	7.7	38.9	21.9	15.0	1.3	258.7	15.4	.9	.9	2.2	633.0
Victoria	11.6	174.0	88.5	179.2	4.5	87.9	3.6	18.2	1.0	160.7	11.2	4.1	.7	18.4	763.0
Peterborough	27.5	136.3	24.5	144.1	15.7	75.7	5.6	10.3	.5	183.1	11.9	1.7	2.5	11.0	650.0
Haliburton	3.3	57.1	5.1	165.4	5.2	70.4	5.4	13.8	1.1	371.9	20.2	.2	.3	9.1	728.0
Hastings	32.8	40.8	50.1	131.9	21.8	62.5	33.2	22 5	1.6	235.1	14.3	1.8	.5	3.8	642.0
Group	24.1	105.8	52.8	150.3	14.5	73.7	16.1	17.7	1.1	200.6	13.0	2.4	1.1	10.2	683.0
Muskoka	.6	22.1	12.5	201.2	4.2	75.8	5.2	6.4	.7	405.1	23.9	.8	2.9	15.3	776.0
Parry Sound	1.1	25.5	15.1	203.9	6.8	64.8	3.0	3.7	.6	394 2	23.0	.3	1.9	19.2	764.0
Nipissing	.5	24.4	16.2	183.2	7.0	58.4	3.0	8.3	1.5	372.5	40.1	.2	1.1	15.6	732.0
Algoma	10.8	109.3	21.3	154.7	5.8	130.3	1.5	7.1	1.2	351.6	19.8	.5	1.2	13.2	828.0
Group	4.0	51.4	16.4	185.5	5.6	88.9	3.2	6.1	.9	382.2	23.6	.5	1.9	15.8	786.0
The Province	80.6	54.3	41.7	155.3	6.1	64.6	22.8	10.4	2.8	209.8	12.2	1.8	.8	10.8	674.0

PART II.

LIVE STOCK, THE DAIRY AND THE APIARY.

LIVE STOCK.

The condition of farm stock in the spring was thus summarized in the May bulletin : "Stock of all kinds have come through the winter in fair flesh condition, a little thinner than usual owing to the limited supply of fodder, especially of hay. Sheep have suffered considerably during lambing season owing to the unfavorable cold, damp weather, and many lambs have been lost. The litters of pigs are not, according to many reports, quite so large and promising as desired. The health of stock during the winter was exceptionally good. Beyond a few reports of ringworm in pigs, lumpjaw in cattle and grub in sheep, the only disease very prevalent or causing much loss was distemper in horses, reports of the existence of which have come from all parts of the province. The supply of food was quite ample where used economically and where stock were properly housed. Hay was most deficient, the price being $10 to $16 a ton. In some sections there was some old hay to meet this deficiency, and on the whole grain and roots were in fair supply ; while there were here and there cases of absolute want, there appears to have been sufficient in the province for all requirements. Many had enough to bring their stock through in first-class condition, a few were able to buy from their neighbors, some were compelled to reduce their allowance and as a consequence have very thin animals. There is a very general desire expressed for a rapid improvement in the weather and the growth of the grass, as though early and rich pastures were especially needed this year."

References in the August bulletin were as follows : "The bulk of correspondents have a favorable word to say regarding pastures. The frequent rains of May and June gave great growth to grasses of all kinds, although with the drier weather of the last two or three weeks the fields were getting brown in places. Much of the grass in the early part of the season was described as 'soft' in quality owing to the continuous rains, but taken altogether the season was a grand one for the meadows. From several places in the county of Peterborough, and from one or two points in the west, complaints were received concerning injury by grasshoppers. Live stock are in fair condition generally, but hardly as fit as the appearance of pastures during the season would warrant, and one correspondent states that butchers are complaing of the lack of quality in cattle taken off the grass. A small black insect, said to be the horn fly, has caused much annoyance and injury to cattle in most of the counties forming the West Midland group. The general health of all classes of stock, however, is rated as first-class, and no serious form of disease is complained of. While corn fodder and coarse grains will not be abundant there will be plenty of hay, and the prospects for the fall and winter are encouraging."

The November bulletin stated : "Correspondents generally have a good word to say of fall pastures. Live stock came off the grass in pretty good condition, although here and there reported a trifle thin. Cattle do not appear to have suffered from any serious complaint, save that in several counties, but more particularly in the Lake Huron and West Midland groups, the 'horn fly' was very annoying. A good number of stockers were disposed of during the season, and farmers were getting ready for stall feeding as reports were made. Save odd reports of scouring in lambs, favorable words only were heard concerning sheep. More fat mutton than usual will probably appear in the market at the holidays. An unusually large number of hogs were sold on foot during the fall. Swine-breeders report peas scarce, but think that the low prices of other grains will enable them to fatten plenty of pork for the winter market. The supply of fodder is abundant, hay being a crop with a big surplus, and straw being plentiful also, although much of the latter has been badly damaged by frequent rains. The silo is becoming more common in the dairy districts of the West Midland and St. Lawrence and Ottawa groups, but elsewhere farmers appear to be chary regarding corn ensilage."

HORSES. The table following presents the number of horses by classes in 1891 and 1892, by county groups and for the province; also the total number of horses in each district and in the province in each of the five years 1888-92.

Horses.		Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.
Working horses	1892.	49,503	33,851	30,352	69,013	76,731	66,745	24,634	4,839	358,668
	1891.	44,716	32,528	27,526	63,360	71,777	62,318	22,176	4,335	328,736
Breeding mares	1892.	14,615	12,390	9,960	22,307	22,586	18,597	7,828	1,582	109,865
	1891.	17,494	15,578	10,952	25,990	25,803	21,621	8,055	1,695	127,188
Unbroken horses	1892.	32,877	25,196	19,270	44,035	43,106	37,069	16,103	2,625	220,281
	1891.	34,512	27,251	17,683	43,529	46,136	36,821	14,525	2,078	222,535
Totals	1892.	96,995	74,437	59,582	135,355	142,423	122,411	48,565	9,046	688,814
	1891.	96,722	75,357	56,161	132,879	143,716	120,760	44,756	8,108	678,459
	1890.	94,235	72,218	53,697	129,641	140,571	118,959	43,801	6,514	659,636
	1889.	84,975	66,750	52,855	124,325	131,551	111,250	42,135	4,954	618,795
	1888.	81,481	63,098	50,240	119,001	127,929	109,161	40,763	4,545	596,218

There are 688,814 horses of all classes in the province, compared with 678,459 in 1891, or an increase of 10,355; but this increase is confined to working horses, there being 17,323 less breeding mares in 1892 than in the preceding year, and 2,254 less unbroken horses. Every district shows an increase in the number of working horses and a decrease in the number of breeding mares.

HOGS. The total numbers of swine are given in the following table by county groups and for the province for each of the five years 1888-92, and for 1891 and 1892 by classes of over and under one year:

Hogs.		Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St Lawrence and Ottawa.	East Midland.	Northern Districts	The Province.
Over 1 year	1892.	42,312	21,162	21,718	38,639	34,791	46,764	21,040	4,894	231,320
	1891.	39,535	18,467	21,692	36,596	35,959	46,734	20,967	4,175	224,125
Under 1 year	1892.	140,041	66,716	74,594	161,761	148,608	112,951	49,697	11,286	765,654
	1891.	183,849	83,828	82,908	206,747	183,526	115,354	61,897	14,082	932,191
Totals	1892.	182,353	87,878	96,312	200,400	183,399	159,715	70,737	16,180	996,974
	1891.	223,384	102,295	104,600	243,343	219,485	162,088	82,864	18,257	1,156,316
	1890.	242,635	107,506	95,628	239,310	210,985	156,623	75,199	12,673	1,140,559
	1889.	197,015	73,096	74,104	171,444	148,233	115,645	48,411	7,521	835,469
	1888.	186,184	71,343	72,852	165,407	148,291	118,387	49,413	7,202	819,079

While the number of hogs over one year old is 7,195 more than in the preceding year—every district except the Lake Ontario group showing an increase—the falling off of hogs under one year old is so great in every group that the total number of all classes of swine is reduced to 996,974, or 159,342 less than in 1891, and 143,585 less than in 1890. The West Midland counties are raising the most young pigs, although there are more swine over one year old in the St. Lawrence and Ottawa counties and in the Lake Erie group.

HORNED CATTLE. The next table shows by classes the number of cattle in 1891 and 1892, and also the total number in each of the five years 1888-92, by county groups and for the province :

Cattle.		Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.
Working oxen..	1892	812	403	866	355	566	531	817	1,494	5,844
	1891	918	724	863	562	463	697	903	1,586	6,716
Milch cows ...	1892	80,565	71,267	58,979	152,032	126,061	218,453	67,978	12,501	787,836
	1891	83,912	73,129	56,171	152,483	122,929	210,596	61,351	12,663	773,234
Store cattle over 2 years.....	1892	42,215	70,563	42,786	85,393	42,833	53,008	23,790	6,117	366,705
	1891	42,023	65,943	40,106	90,768	43,812	52,701	18,470	5,495	359,318
Young and other cattle..	1892	97,920	120,824	89,023	186,967	127,002	165,180	62,511	19,328	868,755
	1891	92,756	118,545	84,374	184,967	124,267	158,097	58,118	18,423	839,547
Totals.....	1892	221,512	263,057	191,654	424,747	296,462	437,172	155,096	39,440	2,029,140
	1891	219,609	258,341	181,514	428,780	291,471	422,091	138,842	38,167	1,978,815
	1890	222,626	251,736	170,775	414,259	271,991	399,478	131,905	31,942	1,894,712
	1889	224,401	250,936	172,527	417,907	293,214	374,038	132,928	25,948	1,891,899
	1888	226,331	249,858	175,020	418,438	300,757	395,656	136,891	25,687	1,928,638

Oxen appear to be still going out of vogue, there being but 5,844 in the province compared with 6,716 in the previous year and 10,167 in 1890. One-fourth of the oxen are to be found in the more newly settled Northern Districts. An increase in numbers is observed in each of the three other classes comprising the table, bringing the total number of cattle in the province up to 2,029,143, or 50,325 more than in the preceding year. The largest number of store cattle and young and other cattle are to be seen in the West Midland group, but the St. Lawrence and Ottawa district has the most milch cows, and also the largest number of cattle, reckoning all classes.

SHEEP. The following table gives by county groups and for the province the number of sheep by classes in 1891 and 1892, and also the total number in each of the five years 1888-92 :

Sheep.		Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.
Over 1 year....	1892	108,754	143,542	123,793	175,606	144,726	191,327	68,851	23,363	979,962
	1891	105,692	126,263	116,066	179,218	147,705	182,663	58,148	19,958	935,713
Under 1 year..	1892	101,959	135,550	108,392	164,622	119,229	166,439	55,964	18,356	870,511
	1891	88,834	109,905	89,291	149,144	115,348	144,503	45,461	15,552	758,038
Totals.....	1892	210,713	279,092	232,185	340,228	263,955	357,766	124,815	41,719	1,850,473
	1891	194,526	236,168	205,357	328,362	263,053	327,166	103,609	35,510	1,693,751
	1890	172,959	187,861	163,138	255,403	189,080	267,211	76,728	27,315	1,339,695
	1889	146,038	172,656	167,947	257,840	214,475	275,905	89,084	20,235	1,344,180
	1888	147,428	167,270	163,944	254,755	223,363	283,237	91,045	18,002	1,349,044

The number of sheep of all ages in the province is given as 1,850,473, an increase of 156,722 over the figures of the previous year, and this addition is shared by every group. The West Midland and Lake Ontario districts show a decrease in the number of sheep over one year, but the augmentation in the number under one year more than compensates for this, and in every other group each class has an increase compared with 1891. The St. Lawrence and Ottawa group has regained its lead as a sheep raising section, and the West Midland district has to take second place.

THE WOOL CLIP. The following table presents the number of fleeces, with the total and average weights, by county groups and for the province for 1891 and 1892, and also the average for the eleven years 1882 92 :

Districts.	1892.			1891.			1882-92.		
	Fleeces.	Pounds.	lb. per fleece.	Fleeces.	Pounds.	lb. per fleece.	Fleeces.	Pounds.	lb. per fleece.
Lake Erie.....	104,205	616,977	5.92	99,241	553,372	5.58	106,500	597,839	5.61
Lake Huron	139,716	843,961	6.04	108,948	650,357	5.97	123,944	714,976	5.77
Georgian Bay.....	121,666	725,834	5.97	99,818	567,196	5.68	115,418	643,562	5.58
West Midland.....	174,330	1,063,979	6.10	151,915	893,332	5 89	189,251	1,087,784	5.75
Lake Ontario.	145,077	902,601	6.22	114,650	681,544	5.94	156,391	927,318	5.93
St. Lawrence & Ottawa	186,754	986,165	5.28	168,454	874,573	5.19	217,959	1,072,395	4.92
East Midland	66,575	374,009	5.62	47,888	261,926	5.47	66,684	349,201	5.24
Northern Districts....	22,837	130,180	5.70	16,572	92,400	5.58	13,434	75,650	5.63
The Province.....	961,160	5,643,706	5.87	807,486	4,574,700	5.67	939,581	5,468,725	5.53

The weight per fleece for 1892 is a matter for congratulation. Every district shows an increase in this respect compared with both the previous year and the average for the eleven years. The average of 5.87 lb. for the province is an increase of .20 lb. compared with 1891, and an increase of .34 lb. compared with the average for 1882-92. This large increase in the weight per fleece makes the total weight of the clip greater than that of the average for the eleven years, although there are not so many fleeces. The number of fleeces, however, is increasing, there being 961,160 against 807,486 in 1891. In the Lake Ontario counties the average weight per fleece now reaches 6.22 lb, and two other groups run over six pounds.

POULTRY. This is one of the neglected interests of farming, very few keep anything but common "barn-yard" fowls and most farmers are unable to give any accurate statement of results. In the majority of cases they state that they simply keep a small collection that pick up the refuse and shift for themselves. Opinions are divided as to whether they pay or not. Very many state that if improved breeds were introduced and comfortable cheap quarters provided they would prove remunerative. The early spring and summer rains were destructive to young broods of chickens and turkeys. At the present time the general condition is excellent. Low prices have ruled for eggs and much complaining is indulged in, partly laid at the door of the McKinley Bill. The following are fair samples of brief conflicting statements on the subject : "would pay if taken care of;" "the farmer and his wife do not agree as to the profit;" "the most profitable stock upon the farm;" "kept at a loss if we charge all they ate and destroyed;" "no profit on account of low prices;" "good to help supply the farmer's table;" "every farmer keeps

a few fowls whether they pay or not." The table following gives by classes the number of poultry by county groups and for the province in 1891 and 1892, together with the totals for each of the five years 1888-92:

Poultry.		Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.
Turkeys	1892	82,191	61,916	48,559	107,903	126,052	157,392	33,580	10,911	628,504
	1891	62,721	42,495	40,691	93,528	108,605	120,686	31,314	7,867	507,907
Geese	1892	42,340	51,496	49,074	78,408	87,797	95,785	32,878	7,376	445,154
	1891	50,035	57,542	47,920	84,475	91,394	89,479	30,946	6,499	458,290
Other fowls	1892	769,464	663,278	526,355	1,231,689	1,146,399	1,155,921	416,263	95,946	6,005,315
	1891	808,986	685,672	515,226	1,229,683	1,191,489	1,097,341	416,887	91,609	6,039,893
Totals	1892	893,995	776,690	623,988	1,418,000	1,360,248	1,409,098	482,721	114,233	7,078,973
	1891	921,742	785,709	603,837	1,407,686	1,391,488	1,307,506	479,147	108,975	7,006,090
	1890	893,207	778,638	584,440	1,424,388	1,350,131	1,294,763	437,637	91,660	6,854,864
	1889	879,552	727,269	557,286	1,342,071	1,130,730	1,170,461	430,424	66,505	6,304,298
	1888	861,584	712,798	548,482	1,303,997	1,112,998	1,139,227	422,163	62,865	6,164,114

In every district an increase is observed in the number of turkeys. There are, however, 13,136 less geese and 34,578 less of other fowl. The result is a total of all classes of fowl of 7,078,973, compared with 7,006,090 in the previous year.

THE APIARY.

The June bulletin had the following: "The reports regarding the apiary are far from encouraging. In addition to losses by starvation, chilled brood and dysentery were not uncommon. Foul brood was reported in only a few localities, but the death of queens appears to have been more frequent than usual. The reported losses during winter and spring vary from 3 up to 75 per cent.; the average may be placed at about 25 per cent. Just as correspondents wrote, however, fruit blossoms were providing excellent supplies of nectar, and with more seasonable weather bees were beginning to pick up."

The following is taken from the August bulletin: "Swarming is said to have been unusually frequent in most localities, although Middlesex correspondents report to the contrary. While a few complain of the loss of bees since spring, the general report is that colonies are in a fair condition. In fact very little special mention is made of any disease. During the summer the supply of nectar was good, some correspondents reporting linden as being abundant. There is great variation in the reports regarding yield of honey. The returns range from 20 to over 100 lb., but the average may be put at about 35 lb. One of our correspondents, an experienced handler of bees, advises apiarists to be careful to see that each hive has 30 lb. of honey in store on the 1st or 15th of October, in order to ensure the carrying of the bees through the winter."

The November bulletin remarks: "Very little change need be made in our August report upon bees, except that as the season advanced the condition slightly improved. About two-thirds of our bee correspondents report a good honey yield and good quality, one-third report a yield under the average. Very many refer to the low price of honey and thereby confirm their report of a good yield. Only four reports of *foul brood* have been received, three being from Middlesex. This would indicate an improvement upon last year. Our August estimate of 35 lb. per hive is confirmed by the few who this month give actual yields. The number of hives in rural sections is placed at 195,822, so that the total product is 6,853,770 lb."

REMARKS OF CORRESPONDENTS.

Stamford, Welland: I think the Farmers' Institutes have done a good deal of good to our farmers. They have given them a great many new ideas to think over. The travelling dairy has also been a great incentive to better work on the part of our butter makers. The ladies were very much interested in these meetings.

Hullett, Huron: One of the most successful methods of feeding fat cattle is the following: When they are tied up in the fall give them enough roots and hay to keep them thriving, until about Christmas, and then commence with a ration of half a bushel of pulped roots, half a gallon of meal, and one-third of a gallon of peas or oats with a little cut feed for the first meal, followed with a handful of hay. At noon give water and hay, and at night give a ration similar to that of the morning, followed by as much hay as will be eaten clean. In a month or so increase the meal allowance until they get about 2½ gallons, and in the case of very large steers or cows 3 gallons. A few farmers are using corn ensilage, and with success. One man in this district has been feeding 120 steers on corn ensilage, half a gallon of meal and a little hay, and most of the animals are now sold at the highest market price. On the whole I consider ensilage one of the cheapest methods of feeding cattle.

Carrick, Bruce: There is not much change in agricultural methods except that the example of those advanced farmers who have given attention to judicious stock-raising and feeding is now more generally followed, there being a greater tendency to feed to a finish on the farm instead of selling as stockers.

Artemesia, Grey: A greater interest is being taken in dairying in this township, and it is paying well.

St. Vincent, Grey: The method of feeding generally practiced here is: Hay and straw for milch cows and store cattle, and turnips, mangels, hay and meal of peas, oats and barley for fat cattle. Some few have commenced to feed corn ensilage, which I consider a great improvement on the general way of feeding, as ensilage will not taint milk or butter as turnips will, and I find fat cattle do better on it than they do on roots. It can be fed in summer as well as in winter, a greater weight of corn can be grown on land than can be grown of roots, and it leaves the land in better condition for growing a crop of grain next year than roots do.

Innisfil, Simcoe: I believe that more sheep and less grain would be an improvement on our present mode of farming. There are plenty one hundred acre farms in this township without any sheep and with but few cattle.

Dumfries S., Brant: There is not one man breeding mares this year where there were four two years ago, the low prices that prevail for working horses being the cause. In fact there is scarcely sale for them at any price. There are a set of men who advocate breeding saddle and carriage horses, who have bought in old race-horses and claim that by using these our agriculturists can become millionaires. When, however, the farmer comes to take out the blanks and the registered four year olds with their ringbones and spavins and curbs, he will make up his mind that all is not gold that glitters. If breeding carriage and saddle horses was such a sure thing some breeder would have found it out before this time.

Downie, Perth: The methods of feeding are improving yearly. The idea of barely wintering stock has been abandoned, and they are now generally fed with a view to an improvement in flesh. Winter dairying is commanding more attention, and it requires a first-class system of feeding. A few silos have been built, and preparations are being made for the erection of more.

Clarke, Durham: In feeding cattle I give them all the hay they can eat, and about 1½ bushels of roots cut fine with meal on roots; about two gallons per day of mixed meals—barley, oats, peas and buckwheat, equal parts. I let my cattle out every day to give them exercise. Sometimes they will drink a little. A little combing down twice a week does them no harm. I find the buyers are always ready to take my cattle at the highest price.

Matilda, Dundas: The methods of feeding have made wonderful strides in this section in the last few years, and this I believe is due largely to the worth of the Farmers' Institutes. The men sent out by the Ontario Government have done noble work, and have taught us that it is money in our pockets to look after our stock. We have a goodly number of silos.

THE DAIRY.

August reports were to the effect that there was a good flow of milk during the summer, and dairy operations had been brisk. The November bulletin thus referred to dairy matters: "The season has been a fair one for the dairy, pastures generally being in good condition, and the flow of milk being pretty steady. Cheese factories have been well patronised on the whole, although the cheese industry appears to be declining in favor in the Lake Erie district. Butter making appears to have taken an onward stride during the year, and the revival in this branch of dairying has been ascribed by several correspondents to the practical experimental work of the travelling dairies. An improvement in quality is reported from nearly every section of the province, and an advance in price, ranging from one to three cents per pound is noted by several correspondents. The Shorthorn grade is the cow most often found on the Ontario farm, although the Ayrshire is a favorite in the counties along the St. Lawrence. Holsteins and Jerseys are being introduced in various districts."

CHEESE FACTORIES. The following table gives the statistics of 856 cheese factories operated in Ontario in 1892. These figures are estimated from returns received from 710 factories. Similar statistics are given for the previous nine years, together with the annual average for the ten years 1883-92 :

Year.	No.	Quantity of—		Gross value of cheese.	Average No. of patrons.	Average No. of cows.	Milk required to make 1 pound of cheese.	Value of cheese per 100 lb.	Average date of opening.	Average date of closing.
		Milk used.	Cheese used.							
		lb.	lb	$			lb.	$ c.		
1892	856	984,356,444	93,848,948	8,959,939	47,636	346,117	10.49	9 55	May 1	Nov. 6
1891.....	838	865,453,574	81,929,042	7,656,484	45,066	296,194	10.56	9 35	" 4	" 2
1890.....	817	836,387,516	79,364,713	7,189,957	44,838	304,584	10.54	9 06	" 4	Oct. 31
1889...	784	760,146,327	72,592,847	6,787,619	43,215	273,231	10.47	9 35	" 4	" 30
1888	737	686,369,013	65,299,751	6,031,470	42,065	256,780	10.51	9 24	" 5	" 24
1887.....	737	691,934,579	65,638,656	6,918,913	42,512	254,510	10.54	10 54	" 4	" 27
1886.....	770	654,703,243	63,721,621	5,893,818	37,665	237,106	10.27	9 25	" 7	" 29
1885.....	752	733,437,254	71,209,719	5,781,569	44,208	260,244	10.30	8 12	" 4	" 29
1884.....	751	685,964,727	66,939,573	6,998,889	38,646	254,852	10.25	10 46	" 3	" 30
1883.....	635	539,696,197	53,513,032	5,589,339	32,636	193,840	10.08	10 45	" 3	" 30
1883-92 ..	768	743,844,887	71,405,790	6,780,800	41,849	267,746	10.42	9 50	" 4	" 30

The above shows an increase of 18 in the number of factories operated in 1892, and does not include private dairies. The advance in this line of industry has eclipsed all previous efforts, for the output of cheese shows an increase of 11,919,906 pounds. The gross receipts for cheese exceed those of 1891 by $1,303,455, while the average number of patrons increased by 2,570, and the average number of cows whose milk was supplied increased by 39,923. The milk was of a slightly better quality, for 10 49 pounds were required to make a pound of cheese as compared with 10.56 pounds in 1891. Prices, too, were better to the extent of 20 cents per 100 pounds of cheese. The season was three days earlier in opening, and was a week later than the annual average in closing.

The following table shows the statistics of the average factory by county groups for 1891 and 1892. The average for ten years is also given for the province :

Districts.		Factories in operation.	Quantity of—		Gross value of cheese.	Average No. of patrons.	Milk required to make 1 lb. cheese.	Value of cheese per 100 lb.	Average date of opening.	Average date of closing
			Milk used.	Cheese made.						
			lb.	lb.	$		lb.	$ c.		
Lake Erie	1892....	68	1,125,620	105,479	9,962	78	10.67	9 44	May 4	Nov. 8
	1891....	70	1,047,463	97,699	9,053	72	10.72	9 27	" 4	" 2
Lake Huron	1892 ...	47	1,180,943	111,394	10,739	89	10.60	9 64	" 17	" 1
	1891....	49	1,080,611	101,245	9,551	82	10.67	9 43	" 17	" 1
Georgian Bay	1892....	21	723,463	68,642	6,434	59	10.54	9 37	" 18	Oct. 24
	1891....	20	686,049	64,701	6,000	57	10.60	9 27	" 20	" 24
West Midland	1892....	127	1,835,919	172,071	16,652	80	10.67	9 68	April 28	Nov. 15
	1891....	133	1,707,829	159,411	15,075	80	10.71	9 46	" 30	" 13
Lake Ontario	1892....	84	945,509	89,201	8,398	61	10.60	9 41	May 2	" 2
	1891....	75	869,904	81,792	7,615	54	10.64	9 31	" 3	Oct. 30
St. Lawrence & Ottawa	1892....	393	1,010,703	98,460	9,372	41	10.33	9 52	April 28	Nov. 5
	1891....	374	858,129	82,223	7,625	40	10.44	9 27	May 3	Oct. 31
East Midland	1892....	116	1,027,544	98,737	9,386	46	10.41	9 51	April 29	Nov. 2
	1891....	117	934,450	89,730	8,385	44	10.41	9 34	May 1	Oct. 31
The Province	1892....	856	1,149,949	109,637	10,467	56	10.49	9 55	" 1	Nov. 6
	1891....	838	1,032,761	97,767	9,137	54	10.56	9 35	" 4	" 2
	1883-92.	768	968,927	93,013	8,833	55	10.42	9 50	" 4	Oct. 30

There is a further decrease of nine factories in the four western groups and a net increase of 27 in the eastern groups. Every group shows a larger output of cheese, the average increase per factory in the province being 11,870 pounds. The largest relative increase is to be found in the St. Lawrence and Ottawa group.

CREAMERIES. The following table gives by counties the statistics furnished by 29 public creameries (exclusive of winter creameries), showing the quantity and value of butter made, the average number of patrons, the average price of butter per pound, and the average dates of opening and closing :

Counties.	Creameries in operation.	Creameries making returns.	Butter.		Cheese.		Total value of product.	Average No. of patrons.	Average price of butter per lb.	Average date of opening.	Average date of closing.
			Quantity.	Value.	Quan.	Value.					
			lb.	$	lb.	$	$		cts.		
Lambton ...	1	1	13,699	2,877	.....	.....	2,877	20	21 00	May 9	Nov. 11
Huron	5	3	148,243	30,142	.... ..	.....	30,142	440	20 33	" 18	Oct. 21
Bruce	7	5	362,821	75,208	... ..	....	75,208	913	20 73	" 15	Nov. 2
Grey	7	6	615,515	124,229	.....	.....	124,229	1,367	20 18	" 14	Oct. 31
Perth	1	1	62,640	12,840	.....	.....	12,840	180	20 50	" 12	" 31
Wellington ...	2	2	75,000	15,897	.....	.....	15,897	293	21 20	July 11	" 25
Waterloo	3	3	218,799	44,364	73,296	5,372	49,736	542	20 28	May 22	Nov. 22
York	1	1	41,293	9,500	.....	.....	9,500	110	23 01	" 15	Dec. 31
Prince Edward.	1	1	15,530	3,533	64,649	4,371	7,904	75	22 75	" 1	Nov. 15
Leeds&Grenville	4	2	132,110	27,325	.....	.....	27,325	108	20 68	Mar. 29	Dec. 1
Dundas	4	1	62,902	13,410	.....	.....	13,410	61	21 32	April 25	Nov. 26
Stormont	2	1	51,343	10,701	.....	.....	10,701	74	20 84	May 16	" 1
Glengarry	6	2	67,863	14,550	.....	.....	14,550	63	21 44	April 28	" 15
Other counties..	6	...	.....	.....	.....	.....	.....	.....	.....	.....	.....
The Province :											
1892.....	50	29	1,867,758	384,576	137,945	9,743	394,319	1,246	20 59	May 14	Nov. 8
1891	39	30	1,402,309	287,559	199,089	12,207	299,766	3,292	20 51	" 13	" 4

The number of creameries reported in operation in 1892 was 50. This is exclusive of several winter creameries, and shows an increase of 11 over the previous year. The number making returns was one less than in 1891, notwithstanding that special requests were made in our efforts to obtain this information. Of the 29 making returns two made both butter and cheese. These two combination factories used 1,824,191 pounds of milk and manufactured 137,945 pounds of cheese and 36,917 pounds of butter, the whole product realizing $17,613. The average result of 100 pounds of milk was 96.6 cents. The 27 butter factories averaged 67,809 pounds valued at $13,952 as compared with 48,844 pounds in 1891. Only three report gathering the cream by weight, and these average 4.25 pounds cream to a pound of butter. Eight creameries gather the full milk and used 25.21 pounds to make a pound of butter, the average for six years being 24.89 pounds. The value of the product of 100 pounds of milk averaged 84.2 cents. The average number of patrons per creamery increased from 110 in 1891 to 147 in 1892. The following summarizes the results of the three methods :

	Value of product of 100 pounds of milk : 1892.	1891.	1887-92.
Creameries (exclusive of buttermilk)	84.2 cents.	87.0 cents.	83.4 cents.
Butter and cheese factories.....	96.6 "	103.1 "	98.2 "
Cheese factories	91.0 "	88.5 "	90.2 "

FACTORIES AND CREAMERIES IN ONTARIO.

CHEESE FACTORIES IN OPERATION IN ONTARIO DURING 1892, WITH NAME AND POST OFFICE ADDRESS THE SECRETARY OF EACH FACTORY.

NOTE.—No return received from factory marked with asterisk (*); new factories in 1893 (†).

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
ESSEX:			
Colchester S.	Erie Cheese Co.	A. E. Sinasac, Pres.	Harrow.
Mersea	*Blytheswood	Wm. Tilden, Sec.	Blytheswood.
KENT:			
Camden	*Dawn Mills	J. T. Race, Prop	Dawn Mills.
Chatham	*Chatham Centre	D. McNaughton, Sec	Eberts
	Chatham Gore	David McArthur, Pres	Tupperville.
	Sydenham Valley	J. N. McCoy, Sec	Wallaceburg.
Harwich	*Creek Road	John Buller	Harwich.
Howard	*Botany	D. O. Grieves	Botany.
Orford	*Grant's	Samuel Grant, Prop	Turin.
Raleigh	*Smith Bros.	Wm. Smith, Sec	Charing Cross.
ELGIN:			
Aldborough	*Crinan	W. H. McLean	Crinan.
	*Rosedale	H. Terry, Prop.	Aldborough.
	West Lorne, Rodney	John F. Taylor, Sec	West Lorne.
Bayham	Bayham	Benj. Brian, Sec.	Griffin's Corners.
	Bayham Br. (Brownsville)	W. A. Elliott, Sec.	Brownsville.
	New England	O. E. Twiss, Sec	Tilsonburg.
	Nova Scotia St.	J. E. Chute, Pres	Lakeview.
	*Guysborough	J. P. Soper, Prop	Guysborough.
	Vienna	Wm. Watts, Sec	Vienna.
Dorchester S	Avon	Wm. Dafoe, Sec-Treas	Avon.
	Lyons	James Mitchell, Treas	Lyons.
	Springfield	John Clunas, Sec	Springfield.
Dunwich	Dutton	W. A. Ostrander, Prop	Dutton, Box 217.
	Wallacetown	A. Keilor, Prop	Wallacetown.
Malahide	Dunboyne	Noble F. Tufford, Sec.	Dunboyne.
	Malahide	R. Abel, Sec	Seville.
	Northwood	George Beckett, Sec	Aylmer.
Southwold	Iona Station	C. A. Ostrander, Prop	Iona Station.
	Payne's Mills	Wm. Sharon, Sec.	Frome.
	West Magdala	R. R. Cranston, Prop.	West Magdala.
Yarmouth	Elgin	J. W. Scott, Prop	Sparta.
	*Mapleton	Mr. Brodie	Mapleton.
	Yarmouth Centre	W. G. Sanders, Sec	St. Thomas, Box 1133
NORFOLK:			
Charlotteville	Lynedoch	G. R. Gray, Sec	Lynedoch.
	St. Williams	G. W. Newman, Prop	St. Williams.
	Vittoria	John Pow, Sec	Vittoria.
	Walsh	Walter Rollings, Sec.	Walsh.
Houghton	Clear Creek	E. G. Matthews, Prop	Clear Creek.
	Houghton Centre	S. T. Jackson, Prop	Houghton.
Middleton	Courtland	O. E. Twiss, Sec	Tilsonburg.
Townsend	Boston	H. J. Barber, Pres	Boston.
	*Rockford, *Villa Nova	H. W. Foster, Sec	Villa Nova.
	Waterford	S. Cunningham	Waterford.
Walsingham	Carholme	Wm. Knowles, Prop	Carholme.
	Marston	C. H. Brayley, Sec	Marston.
Windham	Bookton	Norman H. McCurdy, Sec	Bookton.
	Nixon	John Gardhaun, Sec.	Nixon.
	Ranelagh	James Walker, Treas	Ranelagh.
	*Vanessa	W J. Reavely.	Vanessa.
Woodhouse	Black Creek	W. C. Parsons, Prop	Jarvis.
	Excelsior	W. H. Olds, Sec	Simcoe.
	Lynn Valley	E. G. Ford, Prop.	Lynn Valley.
HALDIMAND:			
Canborough	Attercliffe Sta	Harold Eagle, Prop.	Attercliffe Sta.
	Canborough	James N. Paget, Prop	Canborough.
Cayuga N.	*Kohler	W. H. Kindree, Sec	Decewsville.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
HALDIMAND.—*Contin'ed.*			
Cayuga S	Cayuga South	Harold Eagle, Prop	Attercliffe Sta.
Dunn	Lake View	F. Splatt, Prop	Dunnville.
Rainham	Selkirk	Joel Hoover, Sec	Selkirk.
Seneca	Tyneside	J. M. Clysdale, Prop	Tyneside.
	York	James N. Paget, Prop	Canborough.
Walpole	*Cheapside	R. A. Walter, Sec	Cheapside.
	Jarvis West	W. C. Parsons, Prop	Jarvis.
WELLAND:			
Bertie	Willowdale	Joshua F. Beam, Prop	Black Creek.
Crowland	Welland Cheese Co	Robert Chaffey	Welland Sta.
Wainfleet	Forks Road	John G. Wills, Sec	Winger.
	Johnson's	James Johnston, Sec	Wellandport.
LAMBTON:			
Bosanquet	Ridge Tree	Alex. Jamieson, Sec	Thedford.
Brooke	Brooke and Warwick	Robt. J. Kelly, Sec	Watford.
	Walnut	John D. Carroll, Sec	Watford.
Enniskillen	†Wilsoncroft	John L. Wilson, Sec-Treas	Wilsoncroft.
Plympton	Forest	Wm. Lougheed, Sec	Forest.
	Gala Bank	Wm. Symington, Prop	Camlachie.
	South Plympton	A. D. Anderson, Sec	Wyoming.
	Uttoxeter	Robert Bailey, Sec	Uttoxeter.
Sarnia	*Vyner	Miles Carrick, Sec	Mandaumin.
Sombra	Sombra Cheese Co	W. S. Howell, Sec	Thornyhurst.
Warwick	*Maple Grove	B. Batchelor, Sec	Birnam.
	Thompson	Wm. Thompson, Sec	Arkona.
	Warwick	J. S. Clarke, Prop	Warwick West.
HURON:			
Ashfield	Ashfield	H. Johnston, Treas	Belfast.
Grey	Ethel	Robert, Barr, jr., Prop	Ethel.
	*Grey and Morris	Daniel Stewart, Sec	Brussels.
	Molesworth	Henry Coghlin, Sec	Molesworth.
	Walton	R. H. Ferguson, Sec	Walton.
Howick	*Fordwich	James Fallis, Sec	Newbridge.
	Peoples	Wm. McKercher, Sec	Wroxeter.
	Springbank	George Padfield, Sec	Gorrie.
Hullett	Constance	R. Jamieson, Sec-Treas	Seaforth.
Stephen	*Centralia	C. Smith, Mfr	Centralia.
Tuckersmith	Rodgerville	James Murray, Sec	Rodgerville.
Turnberry	Bluevale	John Burgess, Sec	Bluevale.
Wawanosh E	Belgrave	George Hood, Sec	Sunshine.
BRUCE:			
Amabel	Wiarton	Geo. H. Johnson, Prop	Wiarton.
Arran	Tara	J. W. Jameson, Sec	Tara.
Brant	Brant	Daniel Sullivan, Sec	Malcolm.
	Dunkeld	Thos. A. Chisholm, Sec	Dunkeld.
Bruce	Climax	Andrew Kirkconnell, Pres	Tiverton.
	Underwood	Amos Hilker, Sec	Underwood.
Carrick	*Belmore	John Hartley, Sec	Belmore.
	Otter Creek	Louis Braun, Sec	Walkerton.
Elderslie	Elderslie	Isaac McClure, Sec	Williscroft.
	Pinkerton	Frank Millson, Sec	Pinkerton.
Greenock	Riversdale	Wm. Waddell, Sec	Kinloss.
Huron	Huron	Adam Ruttle, Pres	Ripley.
	Paramount	P. R. McNay, Sec	Lucknow.
	Pine River	John Thompson, jr., Dir	Pine River.
	Ripley	H. W. Farnell, Sec	Ripley.
Kincardine	Armow	F. Matheson, Sec	Armow.
	Bervie	James Glass, Sec	Bervie.
	Glammis	W. M. Atton, Sec	Glammis.
	*Millarton	Wm. Rutledge, Pres	Millarton.
Kinloss	Lucknow	F. C. McInnes, Sec	Lucknow.
Saugeen	Burgoyne	James White, Sec	Burgoyne.
	Star	John Muir, Sec	Port Elgin.
GREY:			
Artemesia	Flesherton	James Brodie, Sec	Vandeleur.
	Markdale	Henry D. Irwin, Sec	Markdale.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
GREY.—*Continued.*			
Egremont	Boothville	Wm. Ramage, Sec	Dromore.
Holland	Chatsworth	W. A. Ferguson, Sec	Chatsworth.
Normanby	Alsfeldt Ch. & B. Co	C. H. Peterson, Sec	Clifford.
	Mount Forest	Joseph Tuck, Sec	Mount Forest.
	Varney	Chas. Ramage, Sec	Durham.
Osprey	Badjeros	George Bailey Treas	Shrigley.
	Singhampton	Wm. Pearson, Treas	Singhampton.
Proton	Dundalk	Robert Russell, Sec	Dundalk.
	Ventry	James Cavanagh, Sec	Ventry.
	Victoria	Wm. Haines, Prop	Inistioge.
SIMCOE:			
Flos	Elmvale	Wm. Harvey, Sec	Elmvale.
	†Crossland	Noah Cotton	Crossland.
Nottawasaga	Avening	W. G. Carruthers, Sec	Avening.
	Glen Huron	James Connor, Sec	Glen Huron.
	Lavender	Samuel Flach, Prop	Lavender.
	Stayner	W. B. Sanders, Sec	Stayner.
Orillia	Northbrooke	Arch. Fyfe, Sec	Orillia.
Tay	Vasey	George Jones, Sec	Vasey.
Tecumseth	Cookstown	W. F. Moore, Sec	Cookstown.
Tiny	Wyebridge	John Adams, Sec	Wyebridge.
MIDDLESEX:			
Adelaide	*Kerwood	G. S. Hull, Sec	Kerwood.
	Mud Creek	R. J. Coulton, Sec	Springbank.
	Keyser	Hugh E. Wilson, Sec	Arkona.
	*Victoria	John Sullivan	Kerwood.
Biddulph	Cedar Vale	Michael Blake, Sec	Elginfield.
	North Middlesex	Geo. W. Fox, Sec	Lucan.
Caradoc	Caradoc	Wm. E Sawyer, Sec	Mount Brydges.
	Mount Carmel	D. Leitch, Prop	Strathroy.
	Muncey Road	Chas. F. Price, Sec	Burwell Road.
Delaware	Delaware	H. J. Smith, Sec	Lambeth.
Dorchester N.	Burnside	S. Barr, Sec	Mossley.
	*Dorchester Station	Thomas Lane	Dorchester Sta.
	Gladstone	B. Swales, Sec	Gladstone.
	Gore	H. P. Hopkins, Pres	Crampton.
	Harrietsville	F. Kunz, Sec	Harrietsville.
	Thames	J. A. James, Mfr	Nilestown.
Ekfrid	Appin	Hector McFarlane, Sec	Glencoe.
	*Mayfair	John Cooper, Sec	Melbourne.
London	Geary	John Geary, Prop	London, Box 132.
	Melrose	John Ferguson, Sec.-Treas	Ferguson.
	North Branch	Fred Bailey, Sec	Rebecca.
	Proof Line	James Tier, Sec	Arva.
	*Union Hill	R. H. Harding, Sec	Thorndale.
Metcalfe	Napier	Wm. Ormerod, Mfr	Napier.
	Sifton's	Thos. H. Payne, Sec	Cairngorm.
Mosa	Glencoe	Hector McFarlane, Sec	Glencoe.
Nissouri W	Blanshard and Nissouri	Fergus McMaster, Sec	St. Marys.
	Cherry Hill	Hope Webster, Sec	Thamesford.
	Nissouri West	W. Lee, Sec	Thorndale.
Westminster	Belmont	George McKellar, Sec	Belmont.
	Glanworth	Duncan McColl, Sec	Glanworth.
	North Street	H. B. Stephens, Prop	Lambeth.
	Pond Mills	Andrew Elliot, Sec	Pond Mills.
	Westminster	A. E. Carrothers, Sec	Hubrey.
	White Oak	A. F. Anderson, Sec	Wilton Grove.
Williams W.	Rob Roy	Wm. Dickson, Sec	Parkhill.
OXFORD:			
Blandford	Bright	John Riesberry, Pres	Bright.
	Eastwood	W. E. Hopkins, Sec	Eastwood.
Blenheim	Soho Ch. & B. Co	J. E. Pounds, Sec	Drumbo.
Dereham	Brownsville, Culloden, Tilsonburg	W. A. Elliott, Sec	Brownsville.
	Dereham and Norwich	Wm. Jones, Sec	Mount Elgin.
	Dereham and W. Oxford	Wm. Wilson, Pres	Ingersoll.
	Lawson's	W. H. Kneal, Salesman	Holbrook.
	Mount Elgin	Wm. Pow, Sec	Mount Elgin
	Prouse's	Thos. Prouse, Prop	do

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
OXFORD.—*Continued.*			
Dereham	Salford	James Mayberry, Sec	Salford.
	Verschoyle	J. H. Wilkinson, Prop	Verschoyle.
Nissouri E.	Kintore	J. W. Sutherland, Sec	Medina.
	Kintore (East branch)	Thos. W. Alderson, Sec	Kintore.
	*Lakeside	Robert Marshall, Pres	Lakeside.
	Murray Bros	Wm. McLaren, Sec	St. Marys.
	Thamesford	David Lawrence, Sec	Thamesford.
Norwich N.	Dunkin's	T. L. Dunkin, Sec.	Norwich.
	†Norwich Junction	F. S. Stover, Sec	do
	Losee, Burgessville	I. L. Farrington, Prop	do
	Smith's	Hugh McKee, Sec	do
Norwich S	Springford	F. C. Anstice, Sec	Springford.
	Summerville	G. H. Treffey, Sec	Hawtrey.
Oxford E.	Diamond	J. McConnell, Sec	Vandecar.
	Oxford	I. L. Farrington, Prop	Norwich.
	Oxford East and West	M. S. Schell, Sec	Woodstock.
	Beachville	James Ireland, Salesman	Beachville.
Oxford N	Maple Leaf	Thos. Caddey Prop	Banner.
	Oxford North	W. H. Sutherland, Sec	Ingersoll, Box 111
Oxford W.	Oxford West	W. G. Francis, Sec	Ingersoll.
Zorra E	Anderson's	Douglas Bruce, Sec	South Zorra.
	Blandford and Zorra, E.	A. Miller, Sec	Walmer.
	German Union	P. J. Altemann, Sec	New Hamburg.
	Honey Grove	Robert Morton, Prop	Cassel.
	Spring Creek	A. McKay, Sec	Woodstock.
	Strathallan	Alex. King, Sec	Hickson.
Zorra W	Brooksdale	John A. Forbes, Sec	Maplewood.
	Cold Springs	James Ireland	Beachville.
	Red Star	W. H. Sutherland, Sec	Ingersoll, Box 111
	Zorra West	Hugh S. McKay, Sec	Embro.
BRANT			
Brantford	N. Brant	Thos. A. Good, Sec	Brantford.
	*Cainsville	Thomas Hatley, Sec	do
Burford	Cathcart	Chas. Kelly, Sec	Cathcart.
	Harley	I. L. Farrington, Prop	Norwich.
	New Durham	James Paterson, Sec	New Durham.
Dumfries S.	*St. George	John Richardson, Prop	St. George.
Oakland	Oakland	Geo. Taylor, Sec	Oakland.
PERTH:			
Blanshard	Blanshard	George B. Webster, Sec	St. Marys.
Downie	Avonbank	Wm. Tier, Sec	Motherwell.
	Black Creek	Thos. Ballantyne, M.P.P.	Stratford.
	Downie	H. A. Southwick, Prop	Avonton.
	Gore of Downie	John Dempsey, Prop	Fairview.
	*Kastnerville	Geo. Barthel, Pres	Stratford.
Easthope N	Avondale	R. M. Ballantyne, Prop	do
Easthope S.	Tavistock	A. T. Bell, Sec	Tavistock.
Ellice	Classic	D. A. Dempsey, Prop	Stratford.
	*Ellice	P. H. Kelly, Sec	Kinport.
Elma	Donegal	Alex. McKenzie, Prop	Donegal.
	Elma	Wm. Lochhead, Sec	Atwood.
	Elmbank	Robert Cleland, Prop	Listowel.
	Gotham	Joseph Freeman, Sec	Britton.
	Monkton	Andrew Erskine, Sec	Monkton.
	Newry	John Morrison, Sec	Newry.
	Silver Corners	Geo. Richmond, Sec	do
	Trowbridge	John Adams, Sec	Trowbridge.
Fullarton	Cold Creek	Thomas Stacey, Sec	Fullarton.
Logan	Willow Grove	Wm. Pomeroy, Prop	Mitchell.
Mornington	Milverton	G. E. Goodhand, Prop	Milverton.
	*Newton, *Carthage	Hugh Jack, Sec	Newton.
Wallace	Cedar Grove	George V. Poole, Sec	Wallace.
	Wallace	Jeptha Vankleeck, Sec	Listowel.
WELLINGTON:			
Arthur	Conn	John McCulloch, Sec	Conn.
	Kenilworth	George Cushing, Sec	Kenilworth.
Luther W	Arthur and Luther	John McNab, Sec	Arthur.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
WELLINGTON.*Continued.*			
Maryborough	Maryborough	Wm. Wilson, Sec	Rothsay.
	*Riverbank	A. R. McLachlan, Sec	do
	Wyandotte	Thos. J. Paterson, Sec	Moorefield.
Minto	Harriston	W. D. McLellan, Sec	Harriston.
	Minto and Arthur	James Wiseman, Sec	Cotswold.
Peel	Goldstone	W. T. Whale, Sec	Goldstone.
	Peel	John Hought, Sec	Glenallan.
WATERLOO:			
Dumfries N	Galt	W. P. Clay, Prop	Galt.
Wellesley	*Bamberg	Jacob Kaufman, Sec	Bamberg.
	Honey Grove	J. W. Chambers, Prop	Poole.
Wilmot	Oak Grove	George Cousins, Mfr	New Hamburg.
	Philipsburg	John D. Shantz, Prop	Baden.
DUFFERIN:			
Amaranth	Laurel	Jonathan Varcoe, Sec	Laurel.
Melancthon	Shelburne	Jacob Walker, Treas	Shelburne.
Mono	Camilla	Wm. Dynes, Sec	Granger.
LINCOLN:			
Caistor	Caistorville	J. T. Taylor, Sec	Caistorville.
Clinton	Campden	J. N. Fry, Prop	Campden.
Gainsborough	Bismarck	John L. Heaslip, Sec	Wellandport.
WENTWORTH:			
Ancaster	Renforth	D. Hamilton, Sec	Renforth.
Beverly	Beverly	George Paterson, Prop	West Flamboro'.
	Lynden	John A. Bennett, Sec	Copetown.
	Sheffield	P. H. Green, Salesman	Sheffield.
Binbrook	Woodburn	John Edwards, Sec	Woodburn.
PEEL:			
Chinguacousy	Norval	Robert Groat, Prop	Georgetown.
Toronto	†Aberdeen Ch. & B		Springfield on Credit
YORK:			
Georgina	Sutton	D. Pilkey, Prop	Sutton.
King	Eversley	Henry Rogers, Sec	Eversley.
	†Aurora	Alfred Love, Sec	Aurora.
Markham	Cedar Grove	Mrs. J. N. Raymer, Mfr	Box Grove.
	*Ringwood	A. B. Grove	Ringwood.
ONTARIO:			
Mara	Gamebridge	Wm. Stewart, Sec	Gamebridge.
	Uptergrove	George Read, Sec	Uptergrove.
Reach	Manchester	Wm. Spence, Sec	Manchester.
Whitby E	Geneva	James Burns, Mfr	Columbus.
DURHAM:			
Cartwright	Blackstock	Geo. L. McLaughlin, Sec	Blackstock.
Cavan	*Ida	Wm. H. Lough, Sec	Ida.
	Fraserville	Joseph Madill, Sec	Fraserville.
	Mt. Pleasant	S. J. Jamieson, Sec	Mt. Pleasant.
	Millbrook	James Brook, Sec	Millbrook.
Clarke	Newtonville	W. J. Jones, Sec	Clarke.
	Orono	George L. Waddell, Sec	Orono.
Darlington	Darlington	L. M. Courtice, Salesman	Courtice.
	Hampton	F. L. Ellis, Sec	Hampton.
Hope	Hope	Wm. Henwood, Sec	Welcome.
	Perrytown	Fred. Currelley, Sec	Canton.
Manvers	Fleetwood	James Dean, Sec	Lifford.
NORTHUMBERLAND:			
Alnwick	Roseneath	Dennis Keogan, Sec	Hastings.
Brighton	Brighton and Murray	Isaac W. Hennessey, Sec	Wooler.
	*Cedar Hill	Hugh Strong, Prop	Hilton.
	Codrington	A. D. Richards, Pres	Codrington.
	Hilton	A. E. Thorn, Sec	Hilton.
	Standard	John Armstrong, Pres	Warkworth.
Cramahe	Castleton	O. M. Alger, Sec	Castleton.
	Cramahe	R. A. Brintall, Treas	Dundonald.
	*Morganston	Homer Platt, Sec	Morganston.
	Salem	S. E. Dixon, Sec	Colborne.
Haldimand	Glenco	Thos. Hoskin, Sec	Grafton.
	Spring Valley	Jas. Roberts, Sec	Fenella.
	Wicklow	J. W. Roberts, Sec	Grafton.
Hamilton	Baltimore Crown	Samuel Philp Prop	Baltimore

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
NORTHUMBERLAND—*Con.*			
	North Star	Chas. Horsburgh, Sec	Plainville.
Monaghan S	Bensfort	John Riddell, Sec	Bensfort.
Murray	*Fountain	Sheldon Moran, Pres	Frankford.
	*Maple Leaf, B	C. W. Wright, Sec	do
	*Queen's	W. A. Hendrick, Pres	do
	Smithfield	W. H. Potts, Sec	Smithfield.
Percy	*Brickley	A. B. German, Sec	Brickley.
	Model	Douglas Kingsberry, Sec	Hastings.
	Warkworth	T. B. Carlaw, Pres	Warkworth.
Seymour	Brae	Gilbert Bedford, Sec	Campbellford.
	Crow Bay	James C Cleugh, Pres	Sarginson.
	Empire	Robert White, Pres	Campbellford.
	Forest	Alex. Haig, Sec	Menie.
	I. X. L	Wm. Waddell, Sec	Campbellford.
	Meyersburg	Wm. Clark, Pres	Meyersburg.
	Prince of Wales, Valley	John Clark, Sec	Campbellford.
	Ryleston	Arch. Morton, Pres	Springbrook.
	Seymour West	E. C. West, Sec	Campbellford.
	Stanwood	James B. Peoples, Sec	Preneveau.
	Woodland	F. Macoun, Pres	Campbellford.
PRINCE EDWARD:			
Ameliasburg	Ameliasburg	R. J. Graham, Prop	Belleville.
	*Brandy Creek	R. N. Hunt, Pres	Murray.
	Mountain View	A. J. Potter, Sec	Mountain View.
	Quinte	E. Babbitt, Pres	Rednerville.
	Wellers Bay	E. J. Howe, Sec	Consecon.
Athol	Cherry Valley	Luther Platt, Sec	Cherry Valley.
Hallowell	Bloomfield	David S. Hubb, Sec	Bloomfield.
Hillier	Cloverdale	L. G. Dorland, Sec	Wellington.
Marysburg N	Lake View	G. N. Rose, Sec	Waupoos.
	Union	Robert Davison, Sec	Picton
Marysburg S	Black Creek	Wm. Call, Sec	Millford.
	Point Traverse	Alva Rose, Sec	South Bay.
	*Royal Street	W. T. B. Striker, Prop	Milford.
Sophiasburg	*Ben Gill, *Elm Brook	Richard Benson	Picton.
	Big Island	Ryerson Rankin, Sec	Demorestville.
	Grape Vale	J. P. Roblin, Prop	Fish Lake.
	Maple Leaf	Alfred Foster, Sec	do
	Northport	Ira David, Pres	Solmesville
LENNOX AND ADDINGTON:			
Adolphustown	Platt's	Thos. F. Gibbs, jr., Sec	Adolphustown
Amherst Island	Amherst Island	Wm. H. Montrae, Sec	Stella.
Camden	Camden East	Geo. E. Hinch, Sec	Camden East.
	Centreville, Croydon	Wm. Whelan, Prop	Centreville.
	Enterprise, Whitman Creek	Thomas Cancy, Prop	Enterprise.
	Moscow	Vanluven Bros., Props	Moscow.
	Newburgh	George A. Aylesworth, Sec	Newburgh.
Ernesttown	Bath (Phippen's No. 2), Union	W. R. Gordanier, Sec	Morven.
	Empey	M. N. Empey, Sec	Napanee.
	Farmers' Friend	T. F. Aylsworth, Sec	Odessa.
	Metzler	L. L. Gallagher, Sec	Wilton.
	Odessa	James C. Fraser, Sec	Odessa.
Fredericksburg N	Excelsior	E. H. Sills, Salesman	Napanee.
	Napanee	W. N. Dollar, Sec	do
	Palace Road	M. N. Empey, Sec	do
Fredericksburg S	Conway	Wm. Phippen, Prop	Sandhurst.
	Sillsville	S. Mullett, Salesman	Hayburn.
Kaladar	Flinton	Thos. Welsh, Mfr	Flinton.
Richmond	Forest Mills	J. J. Doyle, Sec	Kingsford.
	Selby	Ira B. Hudgins, Sec	Selby.
Sheffield	Clareview	John Garrett, Sec	Erinsville.
	Sheffield	D. E. Rose, Sec	Tamworth.
	Tamworth	J. J. Barry, Sec	do
FRONTENAC:			
Bedford	Bedford Mills	J. P. Tett, Sec.-Treas	Bedford Mills.
	Fermoy, Salem	John McGuire, Sec	Westport.
	Tichborne	George Lake, Prop	Tichborne.
Hinchinbrooke	Iron Junction	R. A. Popplewell, Sec	Godfrey.
	Parham	W. Black, Sec	Parham.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
FRONTENAC. *Continued.*			
Howe Island	Thousand Island	F. J. Henderson, Pres	Pittsferry.
Kennebec	Arden	Mrs. J. W. Price, Sec	Arden.
Kingston	*Glenburnie	Joseph Fowler, Treas	Mt. Chesney.
	Glenvale	J. Watts, Sec	Glenvale.
	Lake Shore	H. E. Wartman, Pres	Portsmouth.
	Union	Joshua Knight, Sec	Elginburg.
Loughborough	Forest	John Moreland, Sec	Sydenham.
	*Railton	Keely & McAuley	Railton.
	Perth Road	Walter Guthrie, Sec	Perth Road.
Oso	Crow Lake	George Bradshaw, Sec	Tichborne.
	Sharbot Lake	C. A. Morris, Sec	Sharbot Lake.
Pittsburg	Central	Thos. Anglin, Sec	Atkinson.
	Granite Hill	F. J. Henderson, Sec	Pittsferry.
	Jackson's	E. W. Jackson, Prop	Gananoque.
	Keenan & Sons	T. A. Keenan, Sec	Kingston.
	Leo Lake	John Dockrill, Prop	Brewer's Mills.
	*Maple Leaf	Thomas Bell	Joyceville.
	Morning Star	Daniel McLean, Prop	Eric.
	Pine Grove	Peter McCallum, Treas	Brewer's Mills.
	Pine Hill	Thomas Todd, Sec	Joyceville.
	Rose Hill	James Lane, Prop	Dufferin.
	*Woodburn	David Rae, Salesman	Willetsholme.
Portland	Bellrock, Hartington	Vanluven Bros., Props	Moscow.
	Bradshaw's	Archie Bradshaw, Sec	Harrowsmith.
	Harrowsmith	J. S. Gallagher, Sec	do
	Verona	Howard Reynolds, Prop	Verona.
Storrington	Battersea	W. J. Anglin	Battersea.
	Bear Creek	N. Jackson, Sec	Sunbury.
	Cold Springs	C. W. Langwith, Sec	do
	Duff's	Alexander Ritchie, Sec	Inverary.
	Excelsior	Mrs. G. E. Clark, Sec	Battersea.
	*Lake Opinicon	Adam Barr	Inverary.
	Sand Hill	W. W. Sands, Sec	Sunbury.
	Sunbury	Gordon Waldron, Sec	do
Wolfe Island	St. Lawrence	Rattray & Kenny, Props	Wolfe Island.
LEEDS AND GRENVILLE:			
Augusta	Charleville, Grenville, Domville, Glenmore	J. W. Place, Sec	Prescott.
	Maple Grove	F. K. Wright, Sec	Algonquin.
	Roebuck	James Keating, Sec	Lansdowne.
	Riverview	John McLean, Sec	Maitland.
	South Branch, South Valley	Frank Meech, Sec	North Augusta.
	Willow	Andrew McNish, Sec	Brockville.
Bastard and Burgess S	Clear Spring	A. Gallagher	Portland.
	*Delta Lake	John W. Russell, Sec	Delta.
	Farmers' Pride	M. F. Bresee, Sec	Philipsville.
	Island City	Omer Brown, Sec	Delta.
	Grand Central	Smith & Knapp, Props	Chantry.
	Myers, Forfar	Thomas Myers, Prop	Forfar.
	*Philipsville	L. N. Phelps, Sec	Philipsville.
	*Plum Hollow	Andrew Derbyshire, Sec	Chantry.
	Poole's	Wm. N. Poole, Prop	Freeland.
	Reliable	B. L. Lyons, Sec	Newboyne.
	*Smith's Valley	R. A. Sheldon, Sec	Harlem.
Crosby N	Ardmore, Westport	John McGuire, Sec	Westport.
Crosby S	Clear Lake Union	George Leggett, Treas	Singleton.
	Dominion	E. V. Halladay, Prop	Elgin.
	Maple Grove, Morton	H. F. Metcalfe, Sec	Morton.
	Ontario	J. T. Gallagher, Sec	Newboro'.
	Rockdale, Elgin Model	J. R. Dargavel, Sec	Elgin.
Edwardsburg	Glensmail (Eager's)	R. J. Bennett, Sec	Glensmail.
	Johnstown (Eager's)	L. Rooney, Sec	Prescott.
	Liezert's Nos. 1 and 2	J. T. Liezert, Sec	Pittston.
	Lime Kiln	Wm. Gore, Sec	Prescott.
	Meinsville	Wm. Eager, Prop	Morrisburg.
	Miller's Nos. 1, 2 and 3	Millar & Ferguson, Props	Spencerville.
	St. Lawrence	Wm Beddie, Sec	Cardinal.
	Shanley (Eager's)	Wm. Holmes, Sec	Shanley.
	Perry Creek	T. J. Curry, Sec	Prescott.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
LEEDS AND GREN.—*Con.*			
Elizabethtown	*Anvern	A. C. Johns, Prop	Fairfield East.
	Barlow	C. L. McCready, Sec	Addison.
	*Excelsior	R. McNish	Brockville.
	Glen Buell	C. J. Gilroy, Sec	Glen Buell.
	*Kilborn Springs	W. Billings, Sec	Lyn.
	*Leeds Union	G. F. Purvis, Sec	do
	Maple Grange	J. P. Gilroy, Sec	do
	North Star	C. M. Taylor, Sec	do
	Orchard Valley	R. J. Jelly, Sec	Jellyby.
	Palace	Cyrenus Stowell, Pres	Addison.
	*Rockspring	W. C. Tackaberry	Rockspring
	Royal Dominion	T. W. Horton	New Dublin.
	*Smith's	Thomas Smith	Greenbush.
Gower S	Heckston	Wm. Eager, Prop	Morrisburg.
Kitley	Farmers' Friend	Charles R. Rudd, Sec	Frankville.
	Glen Elm	Miss Jessie Hunter, Sec	Smith's Falls.
	Newbliss	John MacKay, Sec	Newbliss.
	Robinson	Alex. Cameron, Sec	Smith's Falls.
	Silver Creek	Geo. S. Stratton, Sec	Toledo.
Leeds and Lansdowne	*Birmingham's Cheddar	James Birmingham, Sec	Gananoque.
	Bruce, Fairfax	James Keating, Sec	Lansdowne.
	Coldbrook	Robert Wilson, Sec	Wilstead.
	Cold Glen	J. Willoughby, Prop	Ellisville.
	*Deerlick	John Cowan, Sec	Lansdowne.
	*Dulcemain	Wm. Sliter, Sec	Warburton.
	Gananoque	Wm. Richardson, Sec	Gananoque.
	*Gananoque Junction	John Connor, Pres	do
	Lake View, Lyndhurst	James Berney, Sec	Lyndhurst.
	Lorne, Mountain View	James Donevan, Sec	Gananoque.
	Oak Leaf	M. J. Johnson, Treas	Oak Leaf.
	People's	H. McAlpin, Treas	South Lake.
	*Rapid Valley	C. A. Bradley	Lansdowne.
	St. Lawrence	George E. Godkin, Prop	Escott.
	Sand Bay	Benj. Herbison, Sec	Sand Bay.
	Seeley's Bay	R. Gardiner, Prop	Seeley's Bay.
	Springvale	W. W. Hicock, Salesman	Sweet's Corners.
	Tilley	James W. Grier, Sec	Lansdowne.
	Warburton	John Cook, Sec	Warburton.
Oxford on Rideau	Anderson's	John Anderson, Prop	Oxford Mills.
	Bishop's Mills	Albert Alexander, Sec	Bishop's Mills.
	Kidd's No. 2	A. C. White, Sec	Burritt's Rapids.
	Brown's Bridge	Wm. Eager, Prop	Morrisburg.
	Graham	H. D. Graham, Sec	Miller's Corners.
	Kemptville	Orlando Bush, Sec	Kemptville.
	*Oxford Mills	Levi Patton, Sec	Oxford Mills.
Wolford	Old Fairfield	Rufus Bissell, Sec	Easton's Corners.
	Rideau Valley	John Kerr, Sec	Merrickville.
	Union	George Vancamp, Sec	do
Yonge and Escott	Caintown Union	W. J. White, Sec	Caintown.
	Elbe	Bates & Brown, Props	Elbe Mills.
	*Escott Union	John Herbison, Sec	Rockfield.
	Farmers' Choice	Fred. W. Scovil, Sec	Athens.
	Farmersville	Johnson A. Green, Sec	do
	Holland	H. C. Lynch, Sec	Escott.
	*Junetown, A	A. Z. Purvis, Sec	Caintown.
	Junetown, B	Alvin Avery, Sec	do
	Leeder's	Robert Hogan, Sec	do
	Leeds County	Torrence Purvis, Sec	Yonge Mills.
	*Lillie Springs	R. W. Littlejohn, Pres	Caintown.
	Mallory's	A. W. Mallory, Prop	Mallorytown.
	Mallorytown Union	David E. Forrester, Sec	do
	*Ronan's	Mathew Ronan, Prop	Athens, Box 154.
	Springfield Union	N. Hutchison, Sec	Escott.
DUNDAS:			
Matilda	*Advance No. 2	Richard Anderson, Salesman	Glen Stewart.
	Advance No. 3	S. W. Wood, Sec	Dixon's Corners.
	Dundela, Rowena and Winchester Springs	Wm. Eager, Prop	Morrisburg.
	Farmers'	George Reichardt, Sec	Iroquois.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
DUNDAS.—*Continued.*			
Matilda	Iroquois (Eager's)	T. W. Hare, Sec	Iroquois.
	Maple Grove	Angus Houlahan, Sec	Brinston's Corn's.
	Model, No. 1	E. A. Roode, Prop	Hulbert.
	Morrisburg	C. E. Robertson, Sec	Morrisburg.
Mountain	*Advance, No. 1	Edward Scott, Prop	Heckston.
	Rose & Co., Nos. 1 and 3	John McTavish, Sec	Vancamp.
	South Mountain, Inkerman.	Wm. Eager, Prop	Morrisburg.
Williamsburg	Archer	G. C. Tracy, Sec	Archer.
	Bowman's, No. 13	Wm. Bowman, Sec	Morrisburg.
	Caughnawaga, Red Tavern.	Wm. Eager, Prop	do
	*Denison	Reuben Prunner, Sec	Archer.
	Dunbar	Isaiah Barkley, Sec	Dunbar.
	*Elma, *Colquhoun	John N. Logan	Elma.
	Hoasic	Chas. L. Baker, Sec	Froatsburn.
	North Williamsburg	James Dickie, Sec	N. Williamsburg.
	Riverside (Eager's)	B. H. Hayunga, Sec	Morrisburg.
Winchester	*Aults' No. 1	Chris. Irving, Sec	Cassbridge.
	Chesterville, Connanught. / Ormond, Morewood	Wm. Eager, Prop	Morrisburg.
	Kendrick and Carlisle	W. R. Allison, Sec	Dunbar.
	Maple Ridge	R. D. Fulton, Sec	Chesterville.
	Rose & Co,, No. 2	John McTavish, Sec.	Vancamp.
	Union, (cc-operative)	M. E. Hunter, Sec	Morewood.
	White Globe, No. 1	Alpin Campbell, Prop	Ormond.
STORMONT:			
Cornwall	*Black River, Nos. 1, 2, and 3.	P. N. Tait, Prop	Mille Roches.
	Grant's Corners	Wm. Irvine, Prop	Martintown.
	Mille Roches	P. N. Tait, Sec	Mille Roches.
	Moulinette	D. J. McGilles, Sec	Moulinette.
	Silmser's Corners	W. S. Friend, Sec	Cornwall.
Finch	*Berwick No. 1 and 3	James Small, Prop	Berwick.
	*Co-operative	James Pollock, Pres	do
	Crysler	J. R. Crysler, Sec	Crysler.
	Goldfield	D. H. McLean, Sec	South Finch.
	Johnson, Limerick	Wm. Eager, Prop	Morrisburg.
Osnabruck	*Ashburn, *South Finch	J. N. Logan, Prop	Elma.
	Dickenson Landing	Chas. S. Baker, Sec	Wales.
	Dixson	J. C. Stata, Sec	Lunenburg.
	Farran's Point	J. R. Farran, Sec	Farran's Point.
	Lunenburg	H. McEwan, Sec	Lunenburg.
	North Osnabruck	Gordon Baker, Treas	Osnabruck Centre
	White Clover	George H. Jackson, Sec	Gallingertown.
Roxborough	Avonmore	D. M. McPherson, Prop	Lancaster.
	Berwick, No. 2	Joseph Vance, Treas	Moose Creek.
	*Goldfield, Nos. 3 and 4	C. H. Wood, Prop.	Maxville.
	Tayside No. 2	Alex. Fraser, Sec	Sandringham.
GLENGARRY:			
Charlottenburg	*Allangrove Comb (10)	D. M. Macpherson, Prop	Lancaster.
	Camerontown	Thomas McDonald, Prop	Morrisburg.
	*Fraser's Point	D. A. Fraser, Sec	S. Lancaster.
	Lilly White	W. Irvine, Prop	Martintown.
Kenyon	Allangrove Comb (8)	D. M. Macpherson, Prop	Lancaster.
	*Athol	C. H. Wood, Prop	Maxville.
	*Diamond, No. 2	J. H. Molloy, Sec	Fenaghvale.
	Greenfield, Loch Garry, Baltic	J. J. Cameron, Sec	Greenfield.
	*Spring Creek Comb (4)	W. D. McLeod, Prop	Kirkhill.
Lancaster	Allangrove Comb (5)	D. M. Macpherson, Prop	Lancaster.
	Bredalbane	J. C. McLaurin, Sec	Dalkeith.
	*Pine Grove (Thistle Brand).	R. J. McArthur, Prop	N. Lancaster.
Lochiel	Allangrove Comb (2)	D. M. Macpherson, Prop	Lancaster.
	*McCormick	James Irvine	Dalkeith.
	E. Hawkesbury, No. 3	James Hurley, Sec	Barb.
	*Maple Grove	Kenneth McLennan, Sec	Dalkeith,
	*Spring Creek Comb	W. D. McLeod, Prop	Kirkhill.
PRESCOTT:			
Alfred	Alfred	F. W. Langrell, Sec	Alfred.
	Daoust	Gatien Parisien, Sec	do
	Cote D'Or, Creek	Ovide Dubois	Lafaivre.
	Hughes	Eli Robinson, Sec	Treadwell.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
PRESCOTT.—*Continued*:			
Caledonia	*Diamond, No. 1	J. H. Malloy, Sec	Fenaghvale.
Hawkesbury	Star	A. F. Arnold, Prop	Vankleek Hill.
	*Cardinal	Edmond Cardinal, Prop	Mongenais.
	E. Hawkesbury, Nos. 1, 2 & 6	James Hurley, Sec	Barb.
	*Golden Hill	Samuel Stephen, Sec	Vankleek Hill.
	Hawkesbury	W. H. Byers, Pres	Hawkesbury.
	Maple Leaf	J. C. McAlpine, Sec	St. Ann du Prescott.
	Apple Bee, Nos. 1 and 2	Amede Leroux, Sec	St. Eugene.
	Maple Leaf, No. 2	Joseph Seguin, Treas	Point Fortune.
	*Monolea, No. 1	James Ross	Little Rideau.
	*Monolea, No. 4	John W. Ross	do
	*Spring Creek Comb (5)	McCuaig, Cheney & Co. Props	Vankleek Hill.
	Spring Grove, No. 1	S. N. Morrison, Prop	Henry.
	*Vankleek Hill	D. C. McKinnon, Mnfr	Vankleek Hill.
	*Elm Grove	John McNish	do
	*Albert Lee	Daniel Wyman	Chute à Blondeau.
Longueuil	*Cassburn, L'Orignal	R. H. Marston, Sec	Cassburn.
Plantagenet	Chard	David Brown, Salesman	Chard.
	*Ferryside	R. Hamilton, Sec	Pendleton.
	*Fournier	John Wight, Sec	Fournier.
	Pendleton	Henry Moffatt, Prop	Pendleton.
	Riceville, Burnside	A. McLean, Sec	Riceville.
	St. Isidore	N. Parent, Prop	St. Isidore.
	Star	John McCrank, Sec	Curran.
	Treadwell	A. H. Chessar, Sec	Plantagenet.
RUSSELL:			
Clarence	The Brook	Joseph Menard, Sec	The Brook.
	Clarence Creek, Sarsfield	Dr. A. DesRosiers	Clarence Creek.
Cumberland	Russell, Nos. 1, 2, 3, 4 & 5.	W. A. Munroe, Prop	Navan.
Russell	Bolton, Ridge	Wm. Eager, Prop	Morrisburg.
	Craig & Son, No. 1	W. Craig, Sec	Russell.
	Riverside	Wm. McKeown, Sec	do
	*Spring Hill, No. 1	Eadie & Herrington, Props	Dickinson.
CARLETON:			
Fitzroy	River View	John Stevenson, Prop	Kinburn.
	Union Pride	John Tierney, Sec	Arnprior.
Gloucester	*Leitrim	Wm. Fenton, Sec	Leitrim.
Goulbourn	Golden	Henry Vaughan, Sec	Stapledon.
	Ottawa Valley	Adam Abbott, Sec	Hazeldean.
Gower N	Farmers' Joy	James A. Wallace, Sec	Carsonby.
	North Gower	Edward Kidd, Prop	North Gower.
	Wellington	Wm. Eager, Prop	Morrisburg.
Huntley	Maple Leaf	M. K. Everetts, Prop	Easton's Corners.
Marlborough	Richmond	Wm. Eager, Prop	Morrisburg.
Nepean	Fallowfield		
Osgoode	Kenmore, Marvelville, Osgoode		
	*Co-operation	W. J. Moses, Sec	West Osgoode.
	Craig & Son, No. 2	W. Craig, Sec	Russell.
	Gordon Model	H. D. MacDiarmid, Sec	Dalmeny.
	*Manotick	Geo. Harris, Sec	Manotick.
	*Metcalfe	Thompson Eastman, Sec	Metcalfe.
	*Osgoode, No. 10	A. Walker, Sec	do
	White Globe, No. 2	J. R. Dow, Sec	Vernon.
	White Globe No. 3	John McCaul, Sec	do
	†Wide Awake	H. Cleland, Sec	West Osgoode.
RENFREW:	*York	Alex. Dow, jr., Sec	Metcalfe.
Horton	Maple Home	Robert McLaren, Sec	Renfrew.
McNab	Waba	John Stewart, Sec	Waba.
Pembroke	*Greenwood	Robert Delahey, Sec	Pembroke.
Ross	Forester's Falls	Wm. Grant, Prop	Forester's Falls.
Wilberforce	Rankin	Jos. H. Graham, Sec	Rankin.
	*Wilberforce	Thomas McKibbon, Sec	Eganville.
LANARK:			
Bathurst	*Fallbrook	Walter Cameron	Fallbrook.
	Harper	Joseph Warren, Sec	Harper.
	Scotch Line	Samuel Wilson, Salesman	Allan's Mills.
	Tay Banks, Clareview	W. A. Moore, Sec	Perth.

FACTORIES AND CREAMERIES IN ONTARIO.—*Continued.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
LANARK.—*Continued.*			
Beckwith	Beckwith	D. J. McDougall, Sec	Ashton.
	Valley Queen	A. F. Stewart, Sec	Carleton Place.
Dalhousie	Watson's Corners, Brookside	W. A. Moore, Sec	Perth.
Drummond	Balderson	Andrew Allan, Sec	Balderson
	Dexter	Donald McPhail, Sec	McPhail.
	Drummond Centre	Daniel Walsh, Sec	Drummond.
	Mississippi, Riverside	C. A. Matheson, Sec	Perth.
Elmsley N	Lone Star	B. S. Snider, Sec	Port Elmsley.
Lanark	Boyd's, No. 1	Alfred Hammond, Sec	Innisville.
	Clyde	James Herron, Sec	Herron's Mills
	Fairplay	Thomas Jackson, Sec	Innisville.
	Hopetown	John Stewart, Sec	Hopetown.
	Middleville	A. R McIntyre, Sec	Middleville.
Montague	Cedar Grove	Colin McNab, Sec	Smith's Falls.
	Montague	Isaac Cram, Sec	do
	Roseville	Hugh Clark, Sec	Montague.
Pakenham	Pakenham	B. W. Dunnett, Sec	Pakenham.
Ramsay	Appleton	Milton Teskey, Sec	Appleton.
	I. X. L	Hiram McCreary, Sec	Carleton Place.
	Mississippi Pride	James Robertson, Sec	Almonte.
	Rosedale	Richard Reilly, Sec	Clayton.
Sherbrooke S.	Lake View	John McGuire, Sec	Westport.
VICTORIA :			
Eldon	‡Lorneville	Norman L. Campbell, Sec	Lorneville.
Emily	*Downeyville	C. F. Revill, Mfr	Downeyville.
Fenelon	Cambray	H. J, Lytle, Sec	Cambray.
	Fenelon Falls	F. Sandford, Prop	Fenelon Falls.
Mariposa	Little Britain	Owen Yearsley, Prop	Little Britain.
	Mariposa	David Rogers, Sec	Linden Valley.
Verulam	Bobcaygeon	J. L. Read, Salesman	Bobcaygeon.
	*Dunsford	Robert Thurston, Sec	Dunsford.
	Scotch Line	Morgan Johns, Sec	Bobcaygeon.
PETERBOROUGH :			
Anstruther	Apsley	Wm. Hales, Sec.-Treas	Apsley.
Asphodel	Norwood	Wm. Buck, Treas	Norwood.
	*Ormond	John Coughlin, Sec	Hastings.
	Westwood	John Lancaster, Sec	Westwood.
Belmont	Melrose Abbey	Samuel Elliott, Sec	Norwood.
	Round Lake	John Wright, Pres	Havelock.
	Star	Jamet B. Peoples, Sec	Preneveau.
	Trentbridge	Wm. Johnston, Pres	Havelock.
Douro	Maple Leaf	Maurice Condon, Sec	Douro.
	Pine Grove	E. J. Abbott, Sec	Lakefield.
Dummer	North Dummer	Frank Darling, Sec	Hall's Glen.
	Oakdale	S. S. Spence, Sec	South Dummer.
	Stony Lake, Warminster	S. R. Payne, Sec	Warsaw.
	Warsaw	B. James, jr., Sec	do
Ennismore	Myrtle	J. F. Sullivan, Sec	Ennismore.
Harvey	Cedardale	Wm. Weir, Sec	Lakehurst.
Otonabee	Keene	D. P. McFarlane, Sec	Keene.
	*Lang	David Nelson, Sec	Lang.
	Otonabee Union	George Stewart, Sec	Peterborough.
	Peterborough	Wm. Girvin, Sec	do
	Shearer	John Miller, Sec	Lang.
Smith	Central Smith	J, B. McEwan, Sec	Bridgenorth.
	Cherry Grove	J. G. Armstrong, Prop	Peterborough.
	Lakefield	W. W. Grant, Sec	Lakefield.
	Lakeview	Porter Robinson, Sec	Bridgenorth.
	Missing Link	James Middleton, Sec	Peterborough.
	North Smith	M. E. Sanderson, Sec	Selwyn.
	Trewern	G. W. Fitzgerald, Sec	Lakefield.
HALIBURTON :			
Cardiff	Deer Lake	Alfred W. Willis, Sec	Deer Lake.
Dysart	*Dysart	Edward Holmes, Sec	Haliburton.
	*Haliburton	George Bemister, Sec	do
Minden	Minden	M. Brown, Treas	Minden.
Stanhope	Stanhope	Thomas Godwin, Sec	Boskung.

‡ Burned down in 1892, but rebuilt for 1893.

FACTORIES AND CREAMERIES IN ONTARIO.—*Concluded.*

County and Township.	Name of Factory.	Name of Secretary or other Officer.	Post Office Address.
HASTINGS:			
Carlow and Mayo	Carlow	Andrew Whyte, Sec	Boulter.
	Carlow and Mayo Union	W. J. Douglas, Pres	Fort Stewart.
Dungannon	*Bancroft	Fred. Mullett, Pres	Bancroft.
	L'Amable	J. R. Tait, Sec	L'Amable.
	Walkerville	D. Kavanagh, Pres	Umfraville.
Elzevir	Elzevir	Wm. Wiggins, Pres	Queensborough.
	*Ivory	Edward Sexsmith, Pres	Bridgewater.
Faraday	Page Road	Wm. Campbell, Pres	Rose Island.
Herschel	Maynooth	John Parsons, Sec	Maynooth.
Hungerford	Clair River	Peter Labarge, Pres	Bogart.
	*Cedar	Andrew Kirk	Tweed.
	Kervine	Patrick Murphy, Pres	Stoco.
	Marlbank	Wm. J. Burley, Sec	Marlbank.
	Moneymore	John Thompson, Sec	Moneymore.
	Roblin	James Clare, Pres	Chapman.
	Thomasburg	E. Elliott, Sec	Thomasburg.
	Tweed	Thomas Graham, Pres	Tweed.
	Victoria	Robert Sayers, Sec	do
Huntingdon	Beulah	Martin Baker, Pres	Ivanhoe.
	Daisy	John O'Reilly, Sec	Madoc.
	Glen	Samuel Ray, Pres	Fuller.
	Moira	W. H. Morton, Pres	Moira.
	West Huntingdon	James Haggerty, Pres	West Huntingdon
	White Lake	Hector Wood, Pres	Ivanhoe.
Limerick	Ormsby	S. F. Weaver, Sec	Ormsby.
Madoc	Allen Settlement	W. J. Allen, Pres	Cooper.
	Alexandria	John Caskey, Pres	Madoc.
	Brook Valley	Thomas Burnside, Pres	do
	Cold Spring	A. M. Ketcheson, Pres	do
	Golden	James English, Pres	do
	Madoc	Arch. Thompson, Pres	Queensborough.
	Spring Creek	Alex. McCoy, Pres	Remington.
	*Spring Hill	D. McKenzie, Pres	Madoc.
Marmora	Deloro	Daniel Neil, Pres	Deloro.
	Marmora, Cook, Riverside	Wm. Hilton, Salesman	Marmora.
Monteagle	Greenview	Edward Leveck, Sec	Greenview.
	Hybla	Arthur W. Bartlett, Pres	Monteagle Valley
Rawdon	Central	George A. Johnson, Pres	Anson.
	Enterprise	Turner, Sine, Pres	Sine.
	Evergreen	Robert Lanigan, Pres	Stirling.
	*Harold	John Tanner, Pres	Harold.
	Kingston	James T. Belshaw, Pres	Stirling.
	Maple Leaf	Thomas McKeown, Pres	Big Springs.
	Plum Grove	Fred. Fanning, Pres	Wellman's Cor'rs.
	Springbrook	Thomas J. Thompson, Pres	Springbrook.
	Spry	W. J. Spry, Prop	Big Springs.
	Stirling	Hiram Conley, Pres	Stirling.
Sidney	Bayside	R. J. Graham, Prop	Belleville.
	Frankford	Joshua Anderson, Pres	Frankford.
	Grove	B. Mallory, Sec	do
	Johnston	E. Harry, Sec	Glen Miller.
	Shamrock	Oakley Vandervoort, Pres	Stirling.
	Sidney	J. R. Brower, Pres	Belleville.
	*Sidney Town Hall	S. T. Wilmott, Pres	Wallbridge.
	Springfield	Thomas Steele, Pres	Trenton.
Thurlow	Ashley	Harford Ashley, Sec	Belleville.
	Bronk	James Boldrick, Pres	Canifton.
	East Hastings	W. A. Chapman, Sec	Roslin.
	Halloway	Adam Rushnell	Halloway.
	Thurlow	J. M. Hurley, Pres	Belleville.
	Union	F. Brenton, Pres	Corbyville.
	Zion	Wm. Sills, Pres	Foxboro'.
Tudor	*Millbridge	Chas. Donaldson, Sec	Millbridge.
Tyendinaga	Albert, Read	Michael Corrigan, Pres	Albert.
	Gould's Chedder	Peter Gould, Sec	Napanee.
	Melrose	A. J. McLaren, Sec	Melrose.
	Mountain	R. L. Lazier, Pres	Shannonville.
	*Rosebud	Alex. Coulter, Sec	Myrehall.
	Shannonville	Wm. Clazie, Pres	Belleville.
Wollaston	Coe Hill	R. S. Tivy, Pres	Coe Hill.
	Deseronto	John McCullough, Pres	Deseronto.

CREAMERIES OPERATED IN ONTARIO IN 1892.

County and Township.	Name of Creamery.	Name of Secretary or other Officer.	Post Office Address.
LAMBTON :			
Plympton	Wanstead	Archibald Wark, Manager	Wanstead.
HURON :			
Goderich	Goderich (Town)	John Hannah, Proprietor	Seaforth.
Grey	†Molesworth	Horace Cummings	Molesworth.
Hullett	Londesboro'	George Watt, President	Harlock.
McKillop	Seaforth (Town)	John Hannah, Proprietor	Seaforth.
	‡Winthrop	John C. Morrison	Winthrop.
Tuckersmith	†Brucefield	Hugh McCartney	Brucefield.
BRUCE :			
Brant	†Walkerton (Brill's)	George Balkwell, Manager	Walkerton.
Carrick	Mildmay	James Johnston, Secretary	Mildmay.
Calross	†Formosa	Peter Kunz, Secretary	Formosa.
	Star	S. R. Brill, Secretary	Teeswater.
Elderslie	Chesley	Halliday & Co	Chesley.
	Dobbinton	Wm. Harris, President	Dobbinton.
Kinloss	Whitechurch	J. W. J. Simpson, Secretary	Whitechurch.
GREY :			
Bentinck	Durham	A. M. Dargavel, Proprietor	Durham.
Derby	Pleasant View	James Struthers, Proprietor	Owen Sound.
Egremont	†Dromore	John Philp, Secretary	Dromore.
	Holstein	David Allan, Sec.-Treasurer	Holstein.
Normanby	Ayton	Isaac Wenger, Proprietor	Ayton.
	Saugeen Valley	Charles Heise, Secretary	Neustadt.
St. Vincent	Meaford (Town)	Rorke Bros	Meaford.
Sydenham	Farmer's (1893)	James Smith, Secretary	Owen Sound.
MIDDLESEX :			
London	†Medway	James Carmichael	Arva.
Mosa	†Newbury.	W. Bain, Secretary	Newbury.
OXFORD :			
Oxford, E.	†East and West Oxford	M. S. Schell, Secretary	Woodstock.
PERTH :			
Blanshard	Kirkton	John Hannah, Proprietor	Seaforth.
WELLINGTON :			
Guelph	Springbank	Alex. McIntosh, Sec.-Treas.	Mosborough.
Nichol	Kinnettles	George Wright, Secretary	Elora.
WATERLOO :			
Wellesley	Crosshill	John T. Wilford, Secretary	Crosshill.
Wilmot	Nith Valley (B. and cheese)	Chas. H. Tye, Secretary	Haysville.
Woolwich	St. Jacobs	Brubacher & Snyder, Props.	St. Jacob's.
PEEL :			
Albion	†Silver Springs	L. O. Buist, Secretary	Bolton.
YORK :			
Markham	Locust Hill (1893)	D. B. Nighswander, Secretary	Locust Hill.
Vaughan	Woodbridge	Thos. F. Wallace, Treasurer	Woodbridge.
ONTARIO :			
Reach	Marsh Hill (1893)	Lewis Tomlinson, Secretary	Marsh Hill.
DURHAM :			
Cartwright	†Cedar Grove	Robert Philp, Proprietor	Cadmus.
PRINCE EDWARD :			
Ameliasburg	Sprague (butter and cheese).	John Sprague, Proprietor	Ameliasburg.

†No report received. ‡Separated the cream from 400,000 lb. of milk and churned at Seaforth Creamery.

CREAMERIES OPERATED IN ONTARIO IN 1892.—*Concluded.*

County and Township.	Name of Creamery.	Name of Secretary or other Officer.	Post Office Address.
LENNOX AND ADDINGTON:			
Camden	Newburgh (winter)	E. J. Madden, Proprietor	Newburgh.
Fredericksburg, N.	Excelsior (winter)	Ogden Hinch, Proprietor	Napanee.
LEEDS AND GRENVILLE:			
Crosby, South	†Model	Dargavel & Murphy	Elgin.
Edwardsburg	Ventnor	Millar & Ferguson	Spencerville.
Elizabethtown	†Barlow	Robert Barlow	Addison.
	Elizabethtown (winter)	T. W. Horton	New Dublin.
	Palace (winter)	Cyrenus Stowell	Addison.
Yonge	Twin Elms	C. Johnson & Son, Proprietors	Athens.
DUNDAS:			
Matilda.	†Advance	Thomas Scott, Secretary	Glen Stewart.
	†Banford & Johnston	Wm. Banford, Secretary	Hainsville.
	Rutherford's	Wm. Merkley, Secretary	Irena.
Williamsburg	†Dunbar	M. Carlyle	Dunbar.
STORMONT:			
Osnabruck	Mayflower	James H. Quinn	Osnabruck Centre
	†Stormont (butter and cheese)	John H. Croil	Aultsville.
GLENGARRY:			
Charlottenburg	†Butter Cup	Wm. Irvine.	Mrrtintown.
	Farmer's (winter)	A. R. Foulds	Martintown.
	†Glen Roy	M. A. Munro	Glen Roy.
	Gore.	Abrams & McLennan, Props.	Summerstown.
Kenyon	†St. Elmo	Binion & Rutherford	Iroquois.
Lancaster	†Lancaster		
	Home (winter)	D. M. Macpherson	Lancaster.
	Picnic Grove	Wm. Meldrum	Lancaster.
RUSSELL:			
Russell	†St. Onge	Mr. Dupuis.	St. Onge.
HASTINGS:			
Tyendinaga	Deseronto (winter)	R. Rayburn, Secretary	Deseronto.

†No report received.

STATISTICS OF

LIVE STOCK AND DAIRY PRODUCTS.

HORSES AND HOGS.

TABLE I. Showing by County Municipalities and groups of Counties the number of Horses and Hogs in Ontario in the years 1891 and 1892.

Counties.	Horses.					Hogs.			
	Working horses.	Breeding mares.	Unbroken horses.	Totals.		Over 1 year.	Under 1 year.	Totals.	
				1892.	1891.			1892.	1891.
Essex	9,384	2,679	6,466	18,529	17,868	12,523	38,498	51,021	56,260
Kent	11,634	3,639	8,103	23,376	24,971	10,877	34,863	45,740	60,403
Elgin	8,747	2,451	6,161	17,359	16,722	7,759	24,742	32,501	39,650
Norfolk	7,563	2,560	5,190	15,313	14,162	6,237	22,429	28,666	34,179
Haldimand	6,343	1,992	4,068	12,403	12,332	3,315	12,472	15,787	20,980
Welland	5,832	1,294	2,889	10,015	10,667	1,601	7,037	8,638	11,912
Totals	49,503	14,615	32,877	96,995	96,722	42,312	140,041	182,353	223,384
Lambton	9,600	2,869	5,960	18,429	18,975	4,780	16,990	21,770	22,985
Huron	15,788	5,797	11,781	33,366	32,629	7,560	28,202	35,762	43,208
Bruce	11,463	3,724	7,455	22,642	23,753	8,822	21,524	30,346	36,102
Totals	36,851	12,390	25,196	74,437	75,357	21,162	66,716	87,878	102,295
Grey	15,715	5,192	9,655	30,562	28,783	10,343	32,037	42,380	49,528
Simcoe	14,637	4,768	9,615	29,020	27,378	11,375	42,557	53,932	55,072
Totals	30,352	9,960	19,270	59,582	56,161	21,718	74,594	96,312	104,600
Middlesex	15,341	5,244	11,783	32,368	31,541	8,374	33,557	41,931	47,280
Oxford	10,693	3,335	6,370	20,398	21,255	5,518	29,997	35,515	47,364
Brant	5,812	1,479	3,216	10,507	10,071	2,522	14,455	16,977	21,325
Perth	10,833	3,928	7,380	22,141	21,481	8,432	22,464	30,896	35,532
Wellington	12,764	4,155	8,025	24,944	24,179	6,553	32,007	38,560	45,580
Waterloo	7,920	2,216	3,931	14,067	13,662	2,629	13,817	16,446	25,216
Dufferin	5,650	1,950	3,330	10,930	10,690	4,611	15,464	20,075	21,046
Totals	69,013	22,307	44,035	135,355	132,879	38,639	161,761	200,400	243,343
Lincoln	5,943	1,276	3,113	10,332	10,583	2,235	8,600	10,835	13,811
Wentworth	7,993	1,532	3,141	12,666	13,850	2,185	13,778	15,963	22,572
Halton	5,383	1,198	2,258	8,839	9,327	1,584	9,599	11,183	13,981
Peel	7,476	2,429	3,899	13,804	13,806	3,761	16,695	20,456	25,099
York	13,782	4,895	8,480	27,157	27,669	6,195	32,493	38,688	44,557
Ontario	9,966	4,156	7,846	21,968	21,860	6,441	25,312	31,753	36,667
Durham	8,602	2,841	4,740	16,183	15,905	4,516	15,825	20,341	25,209
Northumberland	10,649	2,522	5,448	18,619	18,445	5,563	19,086	24,649	25,904
Prince Edward	6,937	1,737	4,181	12,855	12,271	2,311	7,220	9,531	11,685
Totals	76,731	22,586	43,106	142,423	143,716	34,791	148,608	183,399	219,485
Lennox & Addington	5,913	1,595	3,556	11,064	10,723	2,535	6,601	9,136	12,340
Frontenac	5,504	1,439	2,691	9,634	10,240	3,323	9,305	12,628	12,418
Leeds and Grenville	11,492	2,555	5,462	19,509	19,518	9,442	19,731	29,173	28,952
Dundas	5,069	971	2,971	9,011	8,587	3,137	8,228	11,365	10,375
Stormont	3,956	1,180	2,755	7,891	7,728	2,175	5,470	7,645	7,406
Glengarry	4,707	1,880	3,407	9,994	9,938	2,950	6,358	9,308	9,413
Prescott	4,219	1,576	2,510	8,305	8,599	4,051	7,212	11,263	10,134
Russell	2,588	980	1,688	5,256	4,881	1,885	6,024	7,909	7,935
Carleton	8,813	2,691	4,586	16,090	15,033	4,967	16,894	21,861	22,335
Renfrew	7,453	2,022	3,875	13,350	14,143	8,005	13,060	21,065	21,645
Lanark	7,031	1,708	3,568	12,307	11,370	4,294	14,068	18,362	19,135
Totals	66,745	18,597	37,069	122,411	120,760	46,764	112,951	159,715	162,088
Victoria	7,615	3,359	5,928	16,902	14,215	4,926	15,024	19,950	24,291
Peterborough	6,056	1,828	3,892	11,776	11,576	5,721	11,899	17,620	23,141
Haliburton	747	311	496	1,554	1,694	784	2,198	2,982	2,573
Hastings	10,216	2,330	5,787	18,333	17,271	9,609	20,576	30,185	32,859
Totals	24,634	7,828	16,103	48,565	44,756	21,040	49,697	70,737	82,864
Muskoka	1,651	559	923	3,133	2,802	1,248	3,244	4,492	5,333
Parry Sound	1,209	364	631	2,204	2,362	1,300	3,055	4,355	4,395
Nipissing	566	143	111	820	729	559	605	1,164	872
Algoma	1,413	516	960	2,889	2,445	1,787	4,382	6,169	7,657
Totals	4,839	1,582	2,625	9,046	8,108	4,894	11,286	16,180	18,257
The Province	358,668	109,865	220,281	688,814	678,459	231,320	765,654	996,974	1,156,316

CATTLE.

TABLE II. Showing by County Municipalities and groups of Counties the number of Cattle in Ontar in the years 1891 and 1892.

Counties.	Working oxen.	Milch cows.		Store cattle over 2 years.		Young and other cattle.	Totals.	
		1892.	1891.	1892.	1891.		1892.	1891.
Essex	226	13,305	13,678	6,306	7,810	16,318	36,155	36,751
Kent	52	15,857	16,832	12,914	12,117	23,531	52,354	52,644
Elgin	77	17,312	18,221	11,279	11,878	22,519	51,187	51,091
Norfolk	280	13,863	14,872	4,780	4,109	13,811	32,734	32,057
Haldimand	45	11,921	11,582	4,393	3,585	12,533	28,892	27,313
Welland	132	8,307	8,727	2,543	2,524	9,208	20,190	19,753
Totals	812	80,565	83,912	42,215	42,023	97,920	221,512	219,609
Lambton	96	17,482	17,407	16,752	15,677	28,683	63,013	61,061
Huron	61	28,931	28,942	30,031	30,278	50,177	109,200	109,067
Bruce	246	24,854	26,780	23,780	19,988	41,964	90,844	88,213
Totals	403	71,267	73,129	70,563	65,943	120,824	263,057	258,341
Grey	652	34,389	32,514	23,685	25,435	54,112	112,808	109,760
Simcoe	214	24,590	23,657	19,131	14,671	34,911	78,846	71,754
Totals	866	58,979	56,171	42,786	40,106	89,023	191,654	181,514
Middlesex	43	33,940	34,792	27,739	34,476	44,208	105,930	118,280
Oxford	83	33,585	34,526	12,815	11,551	28,134	74,617	72,200
Brant	35	10,652	9,932	2,452	2,385	11,542	24,681	23,081
Perth	35	26,816	26,005	14,635	14,057	36,321	77,807	73,700
Wellington	60	23,814	24,109	14,701	15,703	35,530	74,105	75,560
Waterloo	47	13,094	13,765	4,630	4,324	15,567	33,338	33,666
Dufferin	52	10,131	9,414	8,421	8,272	15,665	34,269	32,293
Totals	355	152,032	152,483	85,393	90,768	186,967	424,747	428,780
Lincoln	57	7,495	8,303	2,222	2,644	7,469	17,243	18,306
Wentworth	57	13,874	12,651	2,514	3,372	11,509	27,954	27,842
Halton	134	9,796	8,984	3,415	4,702	11,021	24,366	24,151
Peel	15	12,665	11,800	4,263	4,911	11,214	28,157	27,743
York	..	18,677	21,887	6,468	6,877	16,052	41,197	45,528
Ontario	30	17,517	16,463	9,083	8,763	25,377	52,007	48,961
Durham	99	12,241	11,219	6,297	5,742	16,280	34,917	33,049
Northumberland	158	21,759	21,522	6,895	4,722	19,745	48,557	45,192
Prince Edward	16	12,037	10,100	1,676	2,079	8,335	22,064	20,699
Totals	566	126,061	122,929	42,833	43,812	127,002	296,462	291,471
Lennox and Addington	258	15,477	14,533	6,087	5,217	15,996	37,818	34,212
Frontenac	62	16,893	18,295	5,285	4,618	14,693	36,933	38,316
Leeds and Grenville	20	47,772	46,145	6,471	7,484	25,167	79,430	79,150
Dundas	53	16,284	16,016	2,003	2,089	8,874	27,214	26,150
Stormont	12	15,645	15,538	1,958	2,529	7,490	25,105	24,800
Glengarry	..	18,671	17,891	2,098	2,145	10,847	31,616	29,580
Prescott	23	15,278	13,298	2,116	1,489	10,001	27,418	24,807
Russell	56	7,491	7,405	2,193	1,617	7,343	17,083	14,993
Carleton	....	23,365	22,529	7,322	6,607	21,491	52,178	49,427
Renfrew	....	18,219	18,751	8,932	10,089	21,748	48,899	50,606
Lanark	47	23,358	20,195	8,543	8,817	21,530	53,478	50,050
Totals	531	218,453	210,596	53,008	52,701	165,180	437,172	422,091
Victoria	60	12,976	11,515	10,823	7,050	22,083	45,942	35,392
Peterborough	177	15,535	14,909	5,296	4,246	14,516	35,524	33,738
Haliburton	178	2,538	2,780	1,265	1,147	3,870	7,851	8,154
Hastings	402	36,929	32,147	6,406	6,027	22,042	65,779	61,558
Totals	817	67,978	61,351	23,790	18,470	62,511	155,096	138,842
Muskoka	442	4,173	4,698	2,048	1,600	6,247	12,910	13,345
Parry Sound	481	3,549	3,566	2,061	1,735	5,545	11,636	11,109
Nipissing	20	806	897	319	254	878	2,023	2,231
Algoma	551	3,973	3,502	1,689	1,906	6,658	12,871	11,482
Totals	1,494	12,501	12,663	6,117	5,495	19,328	39,440	38,167
The Province	5,844	787,836	773,234	366,705	359,318	868,755	2,029,140	1,978,815

SHEEP AND POULTRY.

TABLE III. Showing by County Municipalities and groups of Counties the number of Sheep and Poultry in Ontario in the years 1891 and 1892.

Counties.	Sheep.				Poultry.				
	Over 1 year.	Under 1 year.	Totals.		Turkeys	Geese.	Other fowls.	Totals.	
			1892.	1891.				1892.	1891.
Essex	15,616	16,332	31 948	28,192	19,290	12,779	164,931	197,000	210,263
Kent	19,973	18,607	38,580	37,491	16,472	9,408	158,575	184,455	203,013
Elgin	26,474	25,388	51,862	48,344	16,314	5,839	138,738	160,891	158,432
Norfolk	18,621	16,610	35,231	30,148	10,115	4,920	121,667	136,702	129,464
Haldimand	15,372	13,330	28,702	28,390	13,970	5,540	98,070	117,580	119,765
Welland	12,698	11,692	24,390	21,961	6,030	3,854	87,483	97,367	100,805
Totals	108,754	101,959	210,713	194,526	82,191	42,340	769,464	893,995	921,742
Lambton	29,694	28,550	58,244	47,489	16,790	7,704	171,212	195,706	197,835
Huron	57,274	54,029	111,303	92,967	27,062	25,427	301,839	354,328	346,278
Bruce	56,574	52,971	109,545	95,712	18,064	18,365	190,227	226,656	241,596
Totals	143,542	135,550	279,092	236,168	61,916	51,496	663,278	776,690	785,709
Grey	75,922	67,137	143,059	131,333	24,054	24,963	279,055	328,072	313,116
Simcoe	47,871	41,255	89,126	74,024	24,505	24,111	247,300	295,916	290,721
Totals	123,793	108,392	232,185	205,357	48,559	49,074	526,355	623,988	603,837
Middlesex	38,565	36,046	74,611	75,895	37,344	14,321	302,048	353,713	344,641
Oxford	14,990	15,085	30,075	28,933	13,547	7,617	176,026	197,190	196,028
Brant	9,636	9,962	19,598	20,542	4,723	4,028	87,095	95,846	98,343
Perth	28,177	27,099	55,276	55,253	14,659	16,361	218,158	249,178	253,571
Wellington	45,487	42,772	88,259	81,061	18,749	18,535	202,007	239,291	248,149
Waterloo	19,706	18,205	37,911	37,194	10,123	6,679	142,404	159,206	148,907
Dufferin	19,045	15,453	34,498	29,484	8,758	10,867	103,951	123,576	118,047
Totals	175,606	164,622	340,228	328,362	107,903	78,408	1,231,689	1,418,000	1,407,686
Lincoln	11,109	10,201	21,310	18,853	7,781	4,208	77,685	89,674	85,710
Wentworth	13,581	12,292	25,873	26,301	9,329	3,469	102,448	115,246	118,516
Halton	9,732	9,164	18,896	18,801	9,639	6,653	92,444	108,136	88,335
Peel	15,185	11,625	26,810	23,922	19,005	14,283	109,670	142,958	168,973
York	25,864	20,387	46,251	37,989	26,024	15,670	200,736	242,430	244,780
Ontario	24,211	20,122	44,333	47,763	15,137	15,723	167,353	198,213	225,704
Durham	19,507	14,042	33,549	43,902	21,310	14,466	139,333	175,109	166,859
Northumb'rl'd	18,364	14,938	33,302	32,722	14,116	10,757	162,770	187,643	180,727
Prin e Edw'd.	7,173	6,458	13,631	13,400	4,311	2,568	93,960	100,839	111,884
Totals	144,726	119,229	263,955	263,053	126,052	87,797	1,146,399	1,360,248	1,391,488
Lennox & Ad.	13,001	11,664	24,665	18,337	5,655	4,734	94.195	104,584	93,897
Frontenac	14,831	12,745	27,576	31,079	12,286	5,858	90,034	108,178	117,892
Leeds & Gren.	26,654	25,587	52,241	45,632	29,574	14,498	186,402	230,374	217,581
Dundas	6,139	5,165	11,304	12,736	13,099	7,223	202,030	122,352	101,181
Stormont	8,013	6,875	14,888	10,033	4,525	4,860	76,289	85,674	79,979
Glengarry	11,063	8,980	19,983	21,200	7,126	3,263	81,349	91,738	94,381
Prescott	9,912	7,706	17,618	13,876	7,639	5,884	72,461	85,984	73,900
Russell	8,004	6,625	14,629	13,668	9,716	4,752	46,741	61,209	52,451
Carleton	21,851	21,058	42,909	35,740	28,506	17,837	166,906	213,249	186,862
Renfrew	36,009	30,155	66,164	67,752	16,342	12,369	105,847	134,558	132,225
Lanark.	35,910	29,879	65,789	57,113	22,924	14,507	133,767	171,198	157,157
Totals	191,327	166,439	357,766	327,166	157,392	95,785	1,155,921	1,409,098	1,307,506
Victoria	25,235	19,817	45,052	38,549	10,799	10,081	122,282	143,162	156,248
Peterborough	16,131	13,330	29,461	27,139	12,880	9,835	116,270	138,985	135,074
Haliburton	3,929	3,145	7,074	7,127	955	1,006	15,192	17,153	18,866
Hastings	23,556	19,672	43,228	30,794	8,946	11,956	162,519	183,421	168,959
Totals	68,851	55,964	124,815	103,609	33,580	32,878	416,263	482,721	479,147
Muskoka	7,053	5,616	12,669	12,717	5,118	2,002	31,636	38,786	37,408
Parry Sound	6,208	4,615	10,823	8,594	1,710	1,450	24,037	27,197	27,607
Nipissing	644	436	1,080	988	897	475	7,891	9,263	9,088
Algoma	9,458	7,689	17,147	13,211	3,156	3,449	32,382	38,987	34,872
Totals	23,363	18,356	41,719	35,510	10,911	7,376	95,946	114,233	108,975
The Province	979,962	870,511	1,850,473	1,693,751	628,504	445,154	6,005,315	7,078,973	7,006,090

LIVE STOCK SOLD IN YEAR.

TABLE IV. Showing by County Municipalities and groups of Counties the number of Horses, Cattle, Sheep, Hogs and Poultry, sold in the province of Ontario in the year ending June 30, 1892.

Counties.	Horses.	Cattle.	Sheep.	Hogs.	Poultry.
Essex	1,113	7,910	9,475	40,712	79,352
Kent	1,308	13,812	13,685	45,031	63,501
Elgin	1,707	11,532	19,289	35,994	59,819
Norfolk	1,141	6,209	9,503	28,182	40,540
Haldimand	876	5,061	12,158	15,571	46,708
Welland	496	5,421	11,191	10,328	36,652
Totals	6,641	49,945	75,301	175,818	326,572
Lambton	1,285	17,724	15,875	17,792	46,895
Huron	4,434	31,804	35,375	44,126	74,633
Bruce	2,559	22,118	29,709	28,979	51,979
Totals	8,278	71,646	80,959	90,897	173,507
Grey	1,457	21,827	37,981	42,344	74,158
Simcoe	1,836	17,872	28,252	41,965	81,451
Totals	3,293	39,699	66,233	84,309	155,609
Middlesex	2,505	29,989	23,926	49,811	105,383
Oxford	1,482	15,214	10,703	50,507	44,788
Brant	570	6,416	8,470	19,775	33,011
Perth	1,546	18,529	18,897	34,881	48,475
Wellington	1,670	20,343	26,802	48,651	47,215
Waterloo	975	13,163	14,839	23,302	38,864
Dufferin	724	8,189	7,454	16,797	27,853
Totals	9,472	111,843	111,091	243,724	345,589
Lincoln	600	4,309	7,955	11,839	30,839
Wentworth	765	5,513	9,656	20,916	36,238
Halton	527	5,322	6,331	13,136	39,123
Peel	1,002	6,591	9,245	23,046	57,912
York	1,975	14,408	17,741	47,096	84,305
Ontario	1,843	13,701	14,660	35,501	61,300
Durham	916	7,167	8,066	19,813	50,293
Northumberland	1,259	8,546	9,285	20,637	39,479
Prince Edward	426	2,904	3,980	9,596	29,732
Totals	9,313	68,461	86,919	201,580	426,221
Lennox and Addington	517	4,532	6,707	9,436	34,250
Frontenac	482	6,640	8,833	9,988	46,058
Leeds and Grenville	970	10,051	17,909	19,829	59,319
Dundas	921	3,012	5,375	7,629	23,655
Stormont	436	2,892	3,198	4,371	15,043
Glengarry	730	3,831	5,699	5,845	19,515
Prescott	506	2,566	4,883	4,906	21,713
Russell	373	2,473	3,650	4,152	21,262
Carleton	646	8,739	12,631	13,231	58,290
Renfrew	656	7,952	17,537	13,019	37,859
Lanark	820	8,309	19,364	13,849	44,043
Totals	7,057	60,997	105,786	106,255	381,007
Victoria	804	8,327	14,541	16,828	38,536
Peterborough	424	6,946	8,467	14,766	28,728
Haliburton	118	1,436	2,294	1,843	3,404
Hastings	786	9,144	13,387	28,737	49,917
Totals	2,132	25,853	38,689	62,174	120,585
Muskoka	293	2,425	3,705	4,362	10,608
Parry Sound	241	2,399	2,932	4,180	7,014
Nipissing	39	462	319	585	2,808
Algoma	196	2,622	4,000	4,907	16,889
Totals	769	7,908	10,956	14,034	37,319
The Province	46,955	436,352	575,934	978,791	1,966,409

WOOL.

TABLE V. Showing by County Municipalities and groups of Counties, the clip of Wool in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92; also the average number of pounds per fleece.

Counties.	1892.			1891.			Yearly average for the eleven years 1882-92.		
	No. of fleeces.	Pounds.	lb. per fleece.	No. of fleeces.	Pounds.	lb. per fleece.	No. of fleeces.	Pounds.	lb. per fleece.
Essex	13,731	80,181	5.84	15,442	88,776	5.75	14,505	81,723	5.63
Kent	19,002	115,447	6 08	21,136	127,116	6.01	20,529	117,860	5.74
Elgin	26,182	162,340	6.20	26,277	153,872	5.86	23,334	134,595	5.77
Norfolk	17,899	100,833	5.63	16,484	91,010	5.52	16,770	89,427	5.33
Haldimand	15,153	96,382	6.36	15,345	95,351	6.21	17,489	104,193	5.96
Welland	12,238	61,794	5.05	12.456	61,724	4.96	13,873	70,041	5.05
Totals	104,205	616,977	5.92	107,140	617,849	5.77	106,500	597,839	5.61
Lambton	28,641	176,426	6.16	27,389	163,504	5.97	25,779	151,217	5.87
Huron	56,605	339,314	5 99	50,891	296,123	5.82	49,202	281,613	5.72
Bruce	54,470	328,221	6 03	52,330	311,521	5.95	48,963	282,146	5.76
Totals	139,716	843,961	6.04	130,610	771,148	5.90	123,944	714,976	5.77
Grey	75,888	452,034	5.96	74,715	427,409	5.72	70,418	392,745	5.58
Simcoe	45,778	273,800	5.98	43,959	255,812	5.82	45,000	250,817	5.57
Totals	121,666	725,834	5.97	118,674	683,221	5.76	115,418	643,562	5.58
Middlesex	38,309	244,766	6.39	41,491	257,580	6.21	38,048	228,270	6.00
Oxford	14,867	89,351	6.01	15,072	87,802	5.83	18,890	108,239	5.73
Brant	9,953	60,686	6.10	11,509	67,741	5 89	13,473	77,500	5.75
Perth	28,087	168,460	6.00	29,560	182,668	6.18	31,664	180,950	5.71
Wellington	44,694	273,660	6.12	45,306	274,048	6.05	47,131	270,605	5.74
Waterloo	18,498	104,789	5.66	21,505	122,669	5.70	21,941	119,311	5.44
Dufferin	19,922	122,257	6.14	17,070	103,066	6.04	18,104	102,909	5.68
Totals	174,330	1,063,979	6.10	181,513	1,095,574	6.04	189,251	1,087,784	5.75
Lincoln	11,973	62,239	5.20	10,093	57,215	5.67	10,476	54,171	5.17
Wentworth	13,091	79,294	6.06	15,257	90,566	5.94	14,871	84,872	5.71
Halton	10,079	69,840	6.93	10,262	67,090	6.54	11,473	71,800	6.26
Peel	15,972	107,265	6.72	14,104	96,354	6.83	15,295	100,271	6.56
York	25,826	166,225	6.44	22,647	142,443	6.29	26,971	162,480	6.02
Ontario	24,193	154,585	6.39	27,001	178,553	6.61	26,806	165,385	6.17
Durham	18,893	120,982	6.40	25,762	157,797	6.13	21,206	124,439	5.87
Northumberland	18,015	104,084	5.78	18,955	110,220	5.81	20,218	115,872	5.73
Prince Edward	7,035	38,087	5.41	7,101	39,892	5.62	9,075	48,028	5.29
Totals	145,077	902,601	6.22	151,182	940,130	6.22	156,391	927,318	5.93
Lennox and Addington	12,018	66,960	5.57	10,071	55,367	5.50	14,219	75,366	5.30
Frontenac	14,698	78,014	5.31	16,526	85,401	5.17	18,051	91,327	5.06
Leeds and Grenville	25,934	134,075	5.17	25,287	127,553	5.04	34,981	171,005	4.89
Dundas	5,552	30,653	5.52	7,141	37,110	5.20	10,088	50,684	5.02
Stormont	8,030	44,109	5.49	6,049	34,212	5.66	9,387	48,911	5.21
Glengarry	10,244	55,916	5.46	13,634	70,157	5.15	14,852	70,721	4.76
Prescott	9,743	53,168	5.46	8,208	45,939	5.60	10,615	52,816	4.98
Russell	8,157	45,987	5.64	7,592	42,865	5.65	7,894	39,165	4.96
Carleton	21,239	117,677	5.54	19,348	103,524	5.35	27,293	139,240	5.10
Renfrew	35,148	177,138	5.04	38,980	189,313	4.86	37,078	170,820	4.61
Lanark	35,991	182,468	5.07	33,000	167,101	5.06	33,501	162,340	4.85
Totals	186,754	986,165	5.28	185,836	958,542	5.16	217,959	1,072,395	4.92
Victoria	24,296	143,937	5.92	22,685	124,726	5.50	22,006	122,746	5.58
Peterborough	15,588	86,145	5 53	15,051	82,866	5.51	16,594	87,945	5.30
Haliburton	3,700	19,040	5.15	4,180	20,693	4.95	3,472	16,732	4.82
Hastings	22,991	124,887	5.43	17,107	86,286	5.04	24,612	121,778	4.95
Totals	66,575	374,009	5.62	59,023	314,571	5.33	66,684	349,201	5.24
Muskoka	7,202	37,011	5.14	7,425	39,643	5.34	6,099	32,538	5.33
Parry Sound	6,396	36,771	5.75	5,187	29,634	5.71	2,912	16,698	5.73
Nipissing	572	2,834	4.95	598	3,211	5.37	149	748	5.02
Algoma	8,667	53,564	6.18	7,334	44,618	6.08	4,274	25,666	6 01
Totals	22,837	130,180	5 70	20,544	117,106	5.70	13,434	75,650	5.63
The Province	961,160	5,643,706	5.87	954,522	5,498,141	5.76	989,581	5,468,725	5.53

FACTORY CHEESE.

TABLE VI. Showing by County Municipalities and groups of Counties the quantity and value of Cheese made at 710 factories in Ontario in 1892, the average dates of opening and closing, and the total number of factories reported in operation.

Counties.	Factories in operation.	Factories making returns.	Quantity of Milk used.	Quantity of Cheese made.	Gross value of cheese.	No. of patrons.	Milk required to make 1 lb. cheese.	Value of cheese per 100 lb.	Average date of opening.	Average date of closing.
	No.	No.	lb.	lb.	$		lb.	$ c.		
Essex	2	1	701,906	64,450	6,110	115	10.89	9 48	May 15	Nov. 1
Kent	8	2	1,294,621	121,786	11,513	94	10.63	9 45	" 12	Oct. 30
Elgin	24	20	26,728,050	2,488,687	235,433	1,369	10.74	9 46	April 28	Nov. 12
Norfolk	20	17	18,014,697	1,701,713	161,341	1,421	10.59	9 48	May 1	" 9
Haldimand	10	8	8,677,821	816,779	76,497	707	10.62	9 37	" 14	" 2
Welland	4	4	3,115,147	291,495	27,137	357	10.69	9 31	" 19	" 3
Totals	68	52	58,532,242	5,484,910	518,031	4,063	10.67	9 44	" 4	"
Lambton	12	10	10,070,454	965,600	92,710	867	10.43	9 60	" 15	" 5
Huron	13	10	12,792,581	1,196,067	116,450	932	10.70	9 74	" 18	" 2
Bruce	22	20	24,374,669	2,294,112	226,397	1,749	10.62	9 61	" 17	Oct. 30
Totals	47	40	47,237,704	4,455,779	429,557	3,548	10.60	9 64	" 17	Nov. 1
Grey	12	12	9,977,469	946,577	88,944	780	10.54	9 40	" 17	Oct. 24
Simcoe	9	9	5,215,256	494,895	46,160	462	10.54	9 33	" 19	" 24
Totals	21	21	15,192,725	1,441,472	135,104	1,242	10.54	9 37	" 18	" 24
Middlesex	36	31	46,397,517	4,313,699	415,571	2,233	10.76	9 63	May 1	Nov. 10
Oxford	41	40	91,541,085	8,573,820	826,969	3,043	10.68	9 68	April 16	" 27
Brant	7	5	8,276,508	775,512	74,272	425	10.67	9 58	" 20	" 26
Perth	25	21	39,151,757	3,686,496	362,900	1,891	10.62	9 84	May 3	" 9
Wellington	10	9	15,326,845	1,456,702	140,830	935	10.52	9 67	" 18	Oct. 31
Waterloo	5	4	4,858,572	454,701	43,971	330	10.69	9 67	" 10	Nov. 2
Dufferin	3	3	1,906,560	183,128	17,200	156	10.41	9 39	" 19	Oct. 26
Totals	127	113	207,458,844	19,444,058	1,881,713	9,013	10.67	9 68	April 28	Nov. 15
Lincoln	3	3	3,003,729	278,991	25,310	290	10.77	9 07	May 13	Oct. 27
Wentworth	5	5	6,477,524	610,279	57,443	422	10.61	9 41	" 7	Nov. 15
Peel	1	1	388,000	35,950	3,450	30	10.79	9 50	" 18	Oct. 10
York	4	3	734,053	68,323	6,592	65	10.74	9 65	" 22	" 9
Ontario	4	4	2,379,205	222,133	20,599	257	10.71	9 27	" 10	Nov. 1
Durham	12	11	7,774,340	722,869	67,496	652	10.75	9 34	" 8	" 1
Northumberland	36	30	30,768,289	2,886,671	272,962	1,590	10.66	9 46	April 26	" 4
Prince Edward	19	15	16,551,508	1,597,277	150,792	1,096	10.36	9 44	" 28	" 3
Totals	84	72	68,076,648	6,422,493	604,644	4,402	10.60	9 41	May 2	" 2
Lennox & Addington	26	26	41,464,261	4,059,778	385,837	2,146	10.21	9 50	April 23	" 9
Frontenac	42	37	32,938,868	3,234,938	306,583	1,339	10.18	9 48	" 29	" 5
Leeds and Grenville	109	86	106,123,674	10,169,855	975,040	3,657	10.44	9 59	" 21	" 12
Dundas	36	30	30,595,798	2,951,988	279,224	291	10.36	9 46	" 26	" 6
Stormont	27	17	16,092,012	1,571,548	146,594	704	10.24	9 33	May 2	" 4
Glengarry	43	32	15,744,197	1,501,964	144,178	780	10.48	9 60	" 3	Oct. 31
Prescott	39	23	16,015,649	1,572,173	149,032	809	10.19	9 48	April 28	Nov. 3
Russell	13	12	7,723,697	762,526	72,442	430	10.13	9 50	May 6	Oct. 31
Carleton	23	17	15,463,722	1,492,296	140,714	777	10.36	9 43	" 7	" 28
Renfrew	6	4	2,959,026	289,935	27,186	206	10.21	9 38	" 15	" 22
Lanark	29	28	32,090,448	3,112,608	297,275	1,554	10.31	9 55	" 5	" 27
Totals	393	312	317,211,352	30,719,609	2,924,105	12,693	10.33	9 52	April 28	Nov. 5
Victoria	8	6	3,398,976	321,039	30,233	257	10.59	9 42	May 16	Oct. 31
Peterborough	29	27	23,924,019	2,229,692	211,308	1,281	10.73	9 48	" 5	Nov. 1
Haliburton	5	3	677,345	66,773	6,057	56	10.14	9 07	" 19	Oct. 24
Hastings	74	64	74,754,018	7,256,176	690,973	2,956	10.30	9 52	April 24	Nov. 4
Totals	116	100	102,754,358	9,873,680	938,571	4,550	10.41	9 51	" 29	" 2
The Province	856	710	816,463,873	77,842,001	7,431,725	39,511	10.49	9 55	May 1	" 6
Estimated at 146 factories not reported	....	146	167,892,571	16,006,947	1,528,214	8,125	.....	.....	.....	.....
Total for 856 factories	....	856	984,356,444	93,848,948	8,959,939	47,636	.....	.....	.....	.....

PART III.

VALUES, RENTS AND FARM WAGES.

VALUES OF FARM PROPERTY.

The values of farm land, buildings, implements and live stock are given by county groups and for the province in the following table for 1891 and 1892, also the totals for the province for the same years, and the average for the eleven years 1882-92 :

Districts.		Farm land.	Buildings.	Implements.	Live stock.	Total farm property.
		$	$	$	$	$
Lake Erie	1892..	87,704,562	26,222,339	6,944,080	14,658,104	135,529,085
	1891..	88,701,279	25,713.724	6,883,952	13,751,560	135,050,515
Lake Huron	1892..	69,212,867	19,953,245	5,508,714	14,762,862	109,437,688
	1891..	69,431,012	19,499,390	5,454,333	13,548,985	107,933,720
Georgian Bay	1892..	48,009,693	14,840,087	4,345,387	10,683,827	77,878,994
	1891..	48,372,436	14,630,536	4,292,456	9,475,312	76,770,740
West Midland	1892..	130,521,307	42,332,192	10,271,225	24,770,736	207,895,460
	1891..	132,002,537	41,659,134	10,214,748	23,955,865	207,832,284
Lake Ontario	1892..	133,127,883	44,140,350	10,449,924	22,070,521	209,788,678
	1891..	133,593,790	42,166,347	10,195,842	20,799,681	206,755,660
St. Lawrence and Ottawa	1892..	102,976,828	34,755,874	9,577,344	20,773,148	168,088,194
	1891..	104,043,863	34,443,701	9,744,170	18,837,837	167,069,571
East Midland	1892..	38,150,853	11,659,203	3,304,834	7,908,690	61,023,580
	1891..	38,939,990	11,451,224	3,278,159	6,790,044	60,459,417
Northern Districts	1892..	6,124,478	1,740,968	601,512	1,868,607	10,335,565
	1891..	6,160,316	1,704,271	587,782	1,561,792	10,014,161
The Province	1892....	615,828,471	195,644,258	51,003,020	117,501,495	979,977,244
	1891....	621,245,223	191,268,327	50,651,442	108,721,076	971,886,068
	1882-92.	632,427,251	180,110,698	48,212,963	103,174,119	963,925,031

Farm land still continues to decline in value, the figures for the province being $5,416,752 less than in the preceding year. The three other items of the table, however, show an increase in value as follows : Buildings, $4,375,931 ; implements, $351,578 ; live stock, $8,780,419. (In previous years the value of *live stock* was asked for in bulk, and in many cases, owing to a misconception of the term, the values of *cattle* only were given. Where detected these discrepancies were weeded out, but this year it was deemed desirable to ask for each class of stock in detail. Notwithstanding that "fancy prices" have been omitted, the aggregate value is $8,780,419 in excess of the figures for the preceding year.) The result is that the value of all farm stock reaches $979,977,244, an increase of $8,091,176 compared with 1891. Taking the districts it will be seen that every group

shows a decrease in the value of farm land, but the opposite is the case in the matter of buildings and live stock, while the St. Lawrence and Ottawa group is the only one failing to show an increase in the value of implements.

VALUE PER ACRE OCCUPIED. The following table gives the value per acre occupied of the various classes of farm property by county groups and for the province, for the years 1891 and 1892:

Districts.	Farm land.		Buildings.		Implements.		Live stock.		Total farm property.	
	1892.	1891.	1892.	1891.	1892.	1891.	1892.	1891.	1892.	1891.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Lake Erie	37 54	38 08	11 22	11 04	2 97	2 96	6 28	5 90	58 01	57 98
Lake Huron	30 15	30 55	8 69	8 58	2 40	2 40	6 43	5 96	47 67	47 49
Georgian Bay	23 72	23 95	7 33	7 24	2 15	2 13	5 28	4 69	38 48	38 01
West Midland	40 10	40 59	13 00	12 81	3 16	3 14	7 61	7 37	63 87	63 91
Lake Ontario	43 69	43 90	14 49	13 85	3 43	3 35	7 24	6 83	68 85	67 93
St. Lawrence and Ottawa	19 39	19 60	6 54	6 49	1 80	1 84	3 91	3 55	31 64	31 48
East Midland	14 29	14 68	4 37	4 32	1 24	1 23	2 96	2 56	22 86	22 79
Northern Districts	3 59	3 72	1 02	1 03	35	35	1 09	94	6 05	6 04
The Province	27 19	27 57	8 64	8 49	2 25	2 25	5 19	4 82	43 27	43 13

Compared with the previous year the farm land of the province has decreased in value 38 cents per acre occupied, but buildings show an increase of 15 cents per acre. The figures for implements are unchanged (they were the same also in 1890), while live stock have advanced in value 27 cents per acre occupied. This gives a net increase of 14 cents per acre occupied for all classses of farm property. The West Midland is the only district which does not show an increase in total value. No district equals its own figures of the previous year for farm land; but the Northern Districts is the only group experiencing a decreased value in buildings per acre occupied. Four groups show an increase in the value of implements, two show a decrease, and two have no change in their figures. Every district is credited with an increase in the value of live stock per acre occupied.

In the following table however a still better basis of comparison is furnished, the values per acre of buildings, implements and live stock being calculated on the cleared portion:

Farm property.	Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.		
									1892.	1891.	1882-92.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Buildings	18 14	14 52	13 70	18 08	18 98	14 64	13 43	9 89	16 32	16 21	16 16
Implements	4 80	4 01	4 01	4 39	4 49	4 04	3 81	3 42	4 26	4 29	4 32
Live stock	10 14	10 74	9 86	10 58	9 49	8 75	9 11	10 62	9 80	9 21	9 26
Total	33 08	29 27	27 57	33 05	32 96	27 43	26 35	23 93	30 38	29 71	29 74

The total value of farm property comprising the table shows an increase compared with the previous year, and also with the eleven years 1882-92, notwithstanding that implements do not equal their figures for either of the periods named. The highest value per acre cleared for buildings is found in the Lake Ontario group, for implements in the Lake Erie district, for live stock in the Lake Huron counties, and for all in the Lake Erie group.

RENTALS OF LEASED FARMS. In the following table the average value and rental of such leased farms as were reported on farmers' schedules returned to this Bureau in 1892 is shown by districts. The rental per acre is given on the basis of land occupied and land cleared for 1891 and 1892, with the average for the seven years 1886-92; also the per cent. ratio that the rental bears to the value of land and buildings on the farm:

Leased farms.	Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.
Average value—	$	$	$	$	$	$	$	$	$
Land	4,416	3,660	3,698	5,637	5,517	3,523	3,606	1,075	4,496
Buildings	1,549	1,331	1,224	1,827	1,699	1,453	1,104	569	1,523
Average rental	256	225	219	337	319	199	223	97	265
Rent per acre based on—	$ c.	$ c.	$ c.	c.	$ c.	$ c.	$ c.	$ c.	$ c.
Acres occupied 1892	2 30	1 98	1 67	2 43	2 59	1 33	1 20	42	1 98
Acres occupied 1891	2 28	1 97	1 56	2 36	2 56	1 27	1 46	41	1 95
Acres occupied 1886-92	2 15	1 93	1 57	2 31	2 66	1 34	1 50	44	2 01
Acres cleared 1892	3 03	2 55	2 22	3 06	3 16	2 11	2 08	1 96	2 74
Acres cleared 1891	2 96	2 55	2 20	2 95	3 10	2 00	2 33	1 69	2 70
Acres cleared 1886-92	2 94	2 61	2 24	3 00	3 25	2 15	2 45	1 77	2 80
Per cent. ratio of rental to value of farm 1892	4 29	4 51	4 45	4 52	4 42	4 00	4 73	5 90	4 40
Per cent. ratio of rental to value of farm 1886-92	4 04	4 19	4 28	4 20	4 41	3 84	4 48	4 97	4 22

The number of acres in the average leased farm is somewhat larger than in the previous year, and the average rental for the province is now $265, an improvemennt of $1 over the figures of the previous year. Rentals, both per acre occupied and per acre cleared, are higher than in the preceding year, but do not equal their respective averages for 1886-92. The per cent. ratio of rental to value of farm, however, is .18 better in 1892 than the average for the seven years.

VALUE OF HORSES. The following table gives by county groups and for the province, the value of each of the four classes of farm horses, together with their total value and the value of all classes of horses sold in the year:

Districts.	Working horses.	Breeding mares.	Colts.	Stallions.	Total on hand.	Total sold in year.
	$	$	$		$	$
Lake Erie	4,418,596	1,308,490	1,804,277	250,721	7,782,084	580,899
Lake Huron	3,370,171	1,212,865	1,384,663	274,375	6,242,074	821,578
Georgian Bay	2,759,995	935,693	1,043,976	170,387	4,910,051	300,800
West Midland	6,051,778	2,088,321	2,446,337	464,975	11,051,411	889,114
Lake Ontario	7,054,707	2,241,371	2,437,187	314,492	12,047,757	876,510
St. Lawrence and Ottawa	5,512,143	1,583,436	1,712,320	331,791	9,139,690	576,040
East Midland	2,153,579	672,187	793,779	182,138	3,801,683	169,984
Northern Districts	490,008	160,437	136,887	50,838	838,170	65,207
Totals	31,810,977	10,202,800	11,759,426	2,039,717	55,812,920	4,280,132

The total value of all classes of horses is estimated at $55,812,920, while $4,280,132 worth have been sold. Working horses are valued at $31,810,977, breeding mares at $10,202,800, colts at $11,759,426 and stallions at $2,039,717. The Lake Ontario and West Midland counties show the greatest value for all kinds of farm horses. The value of horses sold during the year in the Lake Huron district amounts to nearly 13.2 per cent. of the value of horses on land in that group, while the ratio of the province is barely 7.7 per cent.

VALUE OF CATTLE. The values of the various classes of cattle, their total value, and the value of all classes of cattle sold during the year, are given in the following table by county groups and for the province:

Districts.	Working Oxen.	Milch Cows.	Store cattle.	Other cattle.	Total on hand.	Total sold in year.
	$	$	$	$	$	$
Lake Erie	40,763	2,348,716	1,123,010	1,269,228	4,781,717	1,523,954
Lake Huron	21,636	2,268,347	2,327,183	1,765,493	6,382,659	3,015,757
Georgian Bay	46,925	1,764,164	1,106,541	1,129,720	4,047,350	1,400,074
West Midland	18,270	5,081,174	2,643,709	2,753,327	10,496,480	4,958,136
Lake Ontario	32,987	4,237,536	1,073,502	1,865,329	7,209,354	2,540,713
St. Lawrence and Ottawa	22,110	5,766,124	1,144,107	1,940,143	8,872,484	1,615,349
East Midland	33,873	1,784,202	510,200	696,497	3,024,772	733,377
Northern Districts	66,800	344,742	126,619	195,498	733,659	191,775
Totals	283,364	23,595,005	10,054,871	11,615,235	45,548,475	15,979,135

The oxen of the province are valued at $283,364; milch cows, $23,595,005; store cattle, $10,054,871, and other cattle, $11,615,235, the total being $45,548,475, while animals to the value of $15,979,135 have been sold. This means that fully 25 per cent. of farm cattle change hands in a year—chiefly to butchers and drovers. The West Midland group is away ahead of every district so far as the sale of cattle is concerned, but milch cows show greatest value in the St. Lawrence and Ottawa group.

Sheep and Hogs. The table following presents the values of sheep and hogs in the province (by classes of over and under one year also) together with the value of sheep and hogs sold during the year by county groups and for the province :

Districts.	Sheep.				Hogs.			
	Over 1 year.	Under 1 year.	Total on hand.	Total sold in year.	Over 1 year.	Under 1 year.	Total on hand.	Total sold in year.
	$	$	$	$	$	$	$	$
Lake Erie	573,956	340,411	914,367	339,654	382,646	551,875	934,521	1,556,738
Lake Huron	874,560	548,258	1,422,818	406,041	227,805	284,445	512,250	805,373
Georgian Bay	676,785	383,254	1,060,039	299,137	209,838	272,803	482,641	688,294
West Midland	1,057,099	634,212	1,691,311	577,150	433,078	706,490	1,139,568	2,190,710
Lake Ontario	927,122	445,318	1,372,440	425,413	406,552	605,975	1,012,527	1,654,547
St. Lawrence and Ottawa	853,951	511,599	1,365,550	397,132	543,350	390,845	934,195	1,176,059
East Midland	385,765	183,140	568,905	150,316	198,840	177,569	376,409	575,974
Northern Districts	119,262	54,865	174,127	45,347	47,295	39,687	86,982	128,157
Totals	5,468,500	3,101,057	8,569,557	2,640,190	2,449,404	3,029,689	5,479,093	8,775,852

The value of sheep sold in 1892 is estimated at $2,640,190, while $8,569,557 worth were left in farmers hands, $5,468,500 representing animals over one year, and $3,101,-057 those under one year. The figures for hogs are peculiarly interesting when compared with other live stock, as the sales were far heavier than the value of the animals on hand at the end of the year, $8,775,852 being sold, while but $5,479,093 were kept over.

Values of Poultry and of Total Live Stock. The next table gives the value of poultry, by classes, as in the tables immediately preceding, and also the total value of live stock on hand and sold during the year :

Districts.	Poultry.					Total value live stock on hand.	Total value live stock sold in year.
	Turkeys.	Geese.	Other fowls.	Total on hand.	Total sold in year.		
	$	$	$	$	$	$	$
Lake Erie	54,460	22,123	168,832	245,415	114,801	14,658,104	4,116,046
Lake Huron	33,294	24,962	144,805	203,061	59,965	14,762,862	5,108,714
Georgian Bay	32,557	27,972	123,217	183,746	51,497	10,683,827	2,739,802
West Midland	66,158	42,828	282,980	391,966	137,176	24,770,736	8,752,286
Lake Ontario	93,583	55,941	278,919	428,443	189,193	22,070,521	5,686,376
St. Lawrence and Ottawa.	110,889	56,594	298,746	466,229	169,308	20,778,148	3,933,888
East Midland	17,946	18,511	100,464	136,921	44,645	7,908,690	1,674,296
Northern Districts	6,461	5,465	23,743	35,669	11,723	1,868,607	442,209
Totals	415,348	254,396	1,421,706	2,091,450	778,308	117,501,495	32,453,617

The value of all classes of poultry on hand is $2,091,450, while $778,308 is the value placed on those which have been sold. The St. Lawrence and Ottawa counties show the best values for all kinds of fowls.

The total value of live stock on hand (including poultry) is estimated at $117,501,495, while $32,453,617 represents the sales. Live stock generally is most largely raised and sold in the West Midland and Lake Ontario counties; but although the value of animals on hand is larger in the St. Lawrence and Ottawa than in the Lake Huron and Lake Erie groups, the sales in the latter districts are heavier.

VALUE OF LIVE STOCK PER HEAD. The following table presents the value of the various classes of live stock per head on hand and sold during the year:

Farm Live Stock.	Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.
	$ c.	c.	$ c	$ c.	$ c.	$ c.	$ c.	c.	$ c.
HORSES:									
Working horses	89 26	91 45	90 93	87 69	91 94	82 59	87 42	101 26	88 69
Breeding mares	89 53	97 89	93 95	93 62	99 24	85 14	85 87	101 41	92 87
Colts	56 00	56 22	55 42	56 86	57 60	47 51	50 49	55 13	54 63
Stallions	382 20	483 05	392 60	459 92	396 59	323 70	476 80	358 01	407 05
Horses sold in year	87 47	99 25	91 35	93 87	94 12	81 63	79 73	84 79	91 15
CATTLE:									
Working oxen	50 20	53 69	54 19	51 46	58 28	41 64	41 46	44 71	48 49
Milch cows	29 15	31 83	29 91	33 42	33 61	26 40	26 25	27 58	29 95
Store cattle	26 60	32 98	25 86	30 96	25 06	21 58	21 45	20 70	27 42
Other cattle	12 96	14 61	12 69	14 73	14 69	11 75	11 14	10 11	13 37
Sold or killed in year	30 51	42 09	35 27	44 33	37 11	26 48	28 37	24 25	36 62
SHEEP:									
Over 1 year	5 28	6 09	5 47	6 02	6 41	4 46	5 60	5 10	5 58
Under 1 year	3 34	4 04	3 54	3 85	3 73	3 07	3 27	2 99	3 56
Sold or killed in year	4 51	5 02	4 52	5 20	4 89	3 75	3 89	4 14	4 58
HOGS:									
Over 1 year	9 04	10 76	9 66	11 21	11 69	11 62	9 45	9 66	10 59
Under 1 year	3 94	4 26	3 66	4 37	4 08	3 46	3 57	3 52	3 96
Sold or killed in year	8 85	8 86	8 16	8 99	8 21	11 07	9 26	9 13	8 97
POULTRY:									
Turkeys	66	54	67	61	74	70	53	59	66
Geese	52	48	57	55	64	59	56	74	57
Other fowls	22	22	23	23	24	26	24	25	24
Sold or killed in year	35	35	33	40	44	44	37	31	40

The average price received per head for the different classes of live stock sold during the year was as follows: Horses, $91.15; cattle, $36.62; sheep, $4.58; swine, $8.97; turkeys, 66 cents; geese, 57 cents; other fowls, 24 cents. Stallions sold averaged $407.05 in price, while working oxen sold for $48.49.

MARKET PRICES. The following table is compiled from market reports of newspapers published at fourteen market centres, and the figures are taken during the period when each of the various articles of farm produce contained in the table is chiefly marketed. The average price is also given for a series of years:

Markets.	Fall wheat, per bushel.	Spring wheat, per bushel.	Barley, per bushel.	Oats, per bushel.	Rye, per bushel.	Peas, per bushel.	Corn (in ear), per bushel.	Buckwheat, per bushel.	Beans, per bushel.	Potatoes, per bushel.	Hay, per ton,	Wool, per lb.
	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.
Belleville	71.8	71.8	41.3	28.7	59.0	59.1	.....	39.7	.....	41.0	7.51	18.9
Brantford	68.1	68.2	42.2	28.9	52.7	56.9	24.1	39.8	.....	53.0	6.98	17.1
Brockville	79.0	79.0	47.5	31.3	57.5	57.5	26.0	42.5	.....	57.1	7.95	25.0
Chatham	66.1	66.6	32.2	27.1	.....	52.8	29.9	.....	90.5	46.6	7.38	17.3
Cobourg	65.0	60.3	41.3	27.7	46.8	54.8	.....	38.8	.....	.....	.....	.....
Guelph	69.8	62.3	42.4	29.2	63.2	56.4	.....	.....	.....	45.4	7.28	18.4
Kingston	71.0	69.9	38.3	28.5	54.8	59.8	30.2	39.2	.....	58.5	8.17	16.3
Lindsay	68.2	67.3	34.3	26.9	48.6	55.7	.....	37.8	.....	33.3	6.83	16.0
London	68.7	68.4	40.4	31.1	55.4	57.1	28.6	38.1	100.0	62.9	7.38	17.0
Ottawa	73.4	73.8	47.7	31.9	.....	64.8	33.3	53.6	.....	58.6	8.39	17.6
Peterborough	71.5	68.9	40.9	29.1	59.9	59.3	.....	39.0	.....	40.9	8.79	16.0
St. Thomas	67.8	67.8	40.0	31.8	.....	50.0	25.0	.....	.....	64.0	8.17	16.5
Stratford	67.9	68.3	39.5	27.8	.....	57.2	.....	.....	.....	53.1	6.74	.....
Toronto	72.8	66.6	42.4	32.6	55.0	60.3	.....	.....	.....	42.5	9.19	21.8
The Province:												
1892	70.7	67.8	41.3	30.8	55.8	59.0	26.3	42.2	98.8	50.4	8.20	18.2
1891	95.1	92.9	49.1	36.5	72.3	63.8	31.1	44.1	106.1	32.6	11.91	19.4
1890	94.2	91.3	50.2	41.1	52.7	60.3	30.5	43.0	128.5	44.3	7.95	20.5
1889	88.4	88.1	44.0	30.5	50.9	55.7	25.9	39.5	126.7	45.5	9.98	20.7
1888	102.4	99.3	60.1	40.5	60.2	65.4	29.3	49.3	113.7	31.7	16.71	20.4
1887	78.4	78.0	56.7	34.6	49.5	55.9	28.7	45.0	97.9	62 8	11.62	22.1
1886	73.6	72.5	51.3	32.0	52.2	52.6	27.6	33.7	83.7	44.9	9.69	19.1
1885	81.5	80.6	55.2	31.5	55.2	58.0	27.9	39.2	80.0	41.1	9.85	17.4
1884	80.5	81.4	53.6	33.1	59.7	64.4	45.0	40 0	118.0	40.0	9.56	17.8
1883	105.0	107.0	57.0	38.0	62.0	71.0	.....	.....	.....	62.0	9.02	16 9
1882	101.0	106.0	65.0	43.0	64.0	74.0	40.0	40.0	197.0	64.0	11.54	16 9
1882-92	88.0	87.7	53.7	35.5	59 7	61.4	31.6	41 6	114.4	45.3	10.08	18.8

The averages for the province show that lower prices prevailed for fall wheat, spring wheat and barley than in any other year of the table, and in 1888 only did oats and corn fall lower than in 1892. Rye, peas and beans are below their average prices, and buckwheat, although above its average for the eleven years, did not equal the figures of four years in the table. Prices for potatoes ruled high, but were exceeded in three years out of the other ten in the schedule. Hay and clover are much below the figures of any year excepting 1890, and wool received less than in any of the five years immediately preceding 1892.

VALUES OF CROPS. The value of each crop is given in the following table, based upon market prices, acreage and yield, for each of the five years 1888 92, together with averages for the eleven years 1882-92:

Crops.	1892.	1891.	1890.	1889.	1888.	Average 1882-92.
	$	$	$	$	$	$
Fall wheat.....	14,488,195	20,800,736	13,439,875	11,493,648	14,162,726	16,090,639
Spring wheat..	5,620,888	9,951,019	7,015,405	5,019,680	6,408,384	7,746,723
Barley	5,069,293	7,925,675	7,831,285	10,290,011	14,0 3,308	10,039,109
Oats	19,945,480	27,378,483	21,687,734	19,625,622	26,514,099	20,920,037
Rye..... ...	631,937	820,337	823,883	728,725	779,772	975,683
Peas.	8,551,714	11,690,367	9,279,756	7,524,645	9,332,490	8,571,520
Corn. {husking.	2,953,358	5,687,773	4,273,410	2,395,283	5,108,976	3,808,846
Corn. {silo	1,897,814					
Buckwheat	1,063,952	1,150,191	883,100	502,668	602,585	629,379
Beans.	529,500	816,546	978,323	471,188	607,756	543,670
Potatoes.....	6,194,068	7,842,219	7,779,575	6,531,766	7,060,733	8,268,701
Mangel-wurzels	828,038	942,356	927,561	577,878	801,653	696,229
Carrots.....	478,420	476,752	526,318	428,995	487,323	459,328
Turnips	6,354,164	6,885,345	4,704,056	3,702,126	4,764,024	4,485,040
Hay	35,955,672	28,498,224	34,232,024	37,208,564	33,570,674	32,438,193
Totals.....	110,562,493	130,866,023	114,382,305	106,500,799	124,244,503	115,683,597

The value of all crops is $110,562,493, which is less than in any year of the table excepting in 1889, and considerably below the average for the eleven years 1882-92. Only two crops, carrots and hay, show higher values than 1891. Six out of the thirteen crops in the table exceed their respective averages for the eleven years 1882-92.

CROP VALUES BY COUNTY GROUPS. The following table shows the total value of field crops by county groups and for the province for each of the five years 1888-92, together with the average for the eleven years 1882-92:

Districts.	1892.	1891.	1890.	1889.	1888.	1882-92.
	$	$	$	$	$	$
Lake Erie	13,040,993	17,117,703	14,656,955	12,835,861	17,781,703	14,660,425
Lake Huron	12,478,818	14,368,299	12,825,695	10,533,759	13,784,820	12,336,251
Georgian Bay	10,163,189	11,543,525	10,539,774	9,785,415	10,420,202	10,186,482
West Midland	23,247,513	29,051,689	25,473,526	20,748,309	27,618,089	24,569,928
Lake Ontario.....	23,503,908	27,355,582	23,333,827	23,786,979	26,293,725	24,916,702
St. Lawrence & Ottawa.	18,988,107	21,893,436	18,298,546	19,699,465	20,008,375	19,992,470
East Midland	7,115,519	7,883,091	7,514,326	7,746,675	6,932,362	7,600,475
Northern Districts	2,024,446	1,652,698	1,739,656	1,364,336	1,405,227	1,420,864
The Province	110,562,493	130,866,023	114,382,305	106,500,799	124,244,503	115,683,597

None of the groups excepting the Northern Districts reach their own figures for 1891, and the Lake Huron counties and the Northern Districts are the only groups going over their respective averages for the eleven years. The Lake Ontario district leads all the others in the value of its field crops, the West Midland group this year dropping to second place.

VALUE OF PRODUCE PER ACRE UNDER CROP. The following table shows the value per acre raised of each of the staple field crops by county groups and for the province for 1891 and 1892, with the averages for 1882-92. The average value of all crops is also given for the same periods :

Crops.	Lake Erie.	Lake Huron.	Georgian Bay.	West Midland.	Lake Ontario.	St. Lawrence and Ottawa.	East Midland.	Northern Districts.	The Province.		
									1892.	1891.	1882-92.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Fall wheat	13 16	14 81	15 67	16 63	15 40	15 66	13 48	17 89	14 99	24 47	17 71
Spring wheat	6 98	9 06	8 31	8 78	7 29	11 44	7 28	10 36	8 63	19 49	13 55
Barley	9 22	10 23	10 77	10 85	10 22	9 15	9 63	10 19	10 15	14 33	13 94
Oats	9 50	11 21	11 22	11 61	11 31	9 87	9 92	10 07	10 71	14 87	12 44
Rye	8 24	9 27	9 45	9 38	7 89	9 63	8 12	11 84	8 65	12 09	9 67
Peas	8 68	12 26	11 28	10 41	11 97	9 42	11 45	13 39	11 04	15 54	12 63
Corn	16 28	17 68	23 40	18 59	17 47	19 53	18 38	13 73	17 78	23 59	18 77
Buckwheat	8 00	8 92	9 83	7 86	8 76	8 02	9 00	10 52	8 50	10 66	8 48
Beans	15 14	13 72	22 44	18 72	17 91	18 92	20 32	17 46	15 93	19 70	20 26
Potatoes	33 62	39 99	45 76	42 48	48 31	35 13	50 12	74 20	42 51	48 95	53 50
Mangel-wurzels	32 15	41 35	38 86	36 62	39 47	30 46	42 20	27 96	37 59	41 04	35 21
Carrots	37 46	49 40	49 15	48 95	52 92	43 98	55 92	42 27	48 13	48 36	44 26
Turnips	34 27	53 06	47 29	49 71	51 28	39 56	47 35	35 37	49 02	54 61	41 84
Hay	14 26	14 69	13 93	15 74	14 87	13 63	11 81	13 28	14 29	11 18	14 04
All crops :											
1892	13 00	14 35	13 86	15 07	13 85	12 63	12 00	14 63	13 68	.....	.....
1891	17 29	17 02	16 57	19 31	16 72	14 96	13 79	12 94	....	16 70	....
1882-92	15 60	15 53	15 09	16 70	15 34	14 20	13 54	15 01	.....	.....	15 28

The figures for 1892 are not flattering. The average value per acre for all crops of the province is $13.68, which is a decrease of $3.02 compared with the previous year, and $1.60 below the average for the eleven years. Hay is the only crop giving a better financial return than in the preceding year, although buckwheat, mangel-wurzels, carrots, trunips and hay exceed their respective averages for the eleven years. The West Midland group has the best return per acre for all crops, while the St. Lawrence and Ottawa counties show the poorest. The Northern Districts is the only group exhibiting a higher total value per acre, although it fails to reach its own average for the eleven years. Compared with respective values in 1891, the West Midland group makes the poorest showing, but taking the averages for the eleven years the Lake Erie's figures for 1892 show the greatest shrinkage.

PER CENT. RATIOS OF VALUES PER ACRE. By means of per cent. ratios the following table compares the values per acre of the various crops with their respective averages for the eleven years 1882-92, by county groups and for the province:

Districts.	Fall wheat.	Spring wheat.	Barley.	Oats.	Rye.	Peas.	Corn.	Buckwheat.	Beans.	Potatoes.	Mangel-wurzels.	Carrots.	Turnips.	Hay.	All field crops.
Lake Erie	78	57	70	76	91	78	82	103	79	71	100	103	97	97	83
Lake Huron	84	74	71	89	89	90	99	116	70	77	114	111	127	104	92
Georgian Bay	85	64	79	95	88	85	135	130	113	80	115	107	112	105	92
West Midland	91	67	71	85	96	80	98	106	92	80	99	104	115	101	90
Lake Ontario	86	52	73	87	90	96	102	100	83	97	110	112	119	106	90
St. Lawrence and Ottawa	94	79	70	85	89	78	109	92	75	63	100	110	111	101	89
East Midland	78	57	74	89	88	96	118	106	98	89	125	130	126	99	89
Northern Districts	98	64	82	92	102	94	116	112	83	106	125	121	108	108	97
The Province	85	64	73	86	89	87	95	100	79	79	107	109	117	102	90

The per cent. ratio of all crops for the province is but 90, or 10 per cent. below the average of the eleven years. None of the cereals reach 100 except buckwheat. Mangels, carrots, turnips and hay are the only crops exceeding 100, and this they do in every district except in the West Midland in the case of mangels. On the other hand, fall wheat, spring wheat, oats and peas have but two figures in their percentages in every group.

LABOR AND WAGES.

The following is from the June bulletin: "There is little that is special to note in the condition of farm labor. Regarding the quality and supply of labor opinions differ. While the greater number of those reporting consider that the right class of hands are available, a strong minority state that good farm laborers are scarce. This is said to be caused by the large emigration of our farmers' sons to the United States, Manitoba and the North-west, their places being taken by "farm pupils" and others from the old country, some of whom are of doubtful quality so far as our agricultural methods are concerned. In some western counties boys from the Barnardo Home are being tried in the place of men, but the moiety paid them is not included in the rates of wages herewith summarised: The amount paid per month for the working season, of say seven months, runs from $14 to $20 with board, the average being $16.79, an increase of 28 cents over that of the previous year. The amount paid without board ranges from $20 to $28, the average being $24.60, or 59 cents more than in 1891. The wages per day of temporary help averages 86 cents with board and $1.15 without board, both these rates slightly exceeding their respective figures of the previous year."

The August bulletin thus summarized the remarks of correspondents: "In nearly every section of the province there was more or less scarcity of farm laborers (especially those of the right sort) during haying and harvesting. The rainy weather, which hindered continuous work, had not a little to do with this, as also the fact that in many instances the grain was ready to cut shortly after haying commenced. The migration of farmers' sons to the North-west was also a factor in lessening the number of hands. Wages during harvesting ranged from $1 to $2 per day, according to locality and the scarcity of help, but most of the returns point to $1.25 with board as the standard for the season. The monthly rate ran from $15 to $32, but the bulk of correspondents report a range of from $20 to $25 with board."

The subject of farm labor was thus dealt with in the November bulletin: "Harvesting came so close upon haying that in many sections a scarcity of field help was experienced for a couple of weeks, but during the remainder of the season there was a sufficiency of farm labor, although skilled men are becoming rare. The continued emigration to the Canadian North-west and the American prairies led some correspondents to express the opinion that farm wages would rise in the near future, but others claim that the low prices ruling for farm produce will tend to lower wages. It is safe to infer, therefore, that there will be but little immediate change in the rates paid to agricultural laborers. Domestic servants are apparently scarcer than ever on the farm, urban life offering greater attractions to girls. The comments of correspondents upon the quality of male and female importations from the 'Homes' is decidely more uncomplimentary than usual."

WAGES OF FARM LABORERS. In the following table the average rates of wages of farm laborers are given by the year and by the month, with and without board, by county groups and for the province for the years 1891 and 1892, together with the averages for the eleven years 1882-92; also the amounts paid domestic servants in 1891 and 1892:

Districts.	Farm laborers.												Domestics per month with board.	
	Per year.						Per month in working season.							
	With board.			Without board.			With board.			Without board.				
	1892.	1891.	'82-92.	1892.	1891.	'82-92.	1892.	1891.	'82-92.	1892.	1891.	'82-92.	1892.	1891.
	$	$	$	$	$	$	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Lake Erie	159	158	159	256	253	250	16 75	16 66	17 29	25 62	25 29	26 17	6 36	6 39
Lake Huron	156	159	162	254	260	257	16 94	17 13	17 80	27 25	26 28	27 35	6 28	6 30
Georgian Bay	151	153	158	260	262	256	16 30	17 34	17 65	25 78	26 86	27 20	6 07	5 97
West Midland	154	157	160	252	250	251	16 38	16 43	17 36	25 49	25 40	26 48	6 41	6 46
Lake Ontario	158	162	163	252	262	253	16 57	16 76	17 41	26 22	25 90	26 57	6 42	6 50
St Law. & Ottawa	152	154	161	242	254	251	15 99	15 99	17 71	24 60	25 20	26 59	5 83	5 76
East Midland	154	166	164	256	258	257	16 31	15 82	17 52	26 28	25 78	26 84	5 76	5 90
Nrth'rn Districts.	166	169	173	270	273	275	18 41	18 19	19 47	28 13	27 12	29 27	6 16	6 13
The Province.	156	158	161	253	257	253	16 52	16 66	17 52	25 92	25 81	26 82	6 21	6 25

The average rate of wages per year, with board, is $156, which is a decline of $2 compared with the figures of the previous year, and $5 less than the average for the eleven years. By the year, without board, the figures are $253, the same as the average for the eleven years, but $4 below the price paid in 1891. During the working season the rate of wages per month with board is $16.52, which is less than in the preceding year, and less also than the average of the eleven years; but the rate paid per month without board is $25.92, an improvement of 11 cents compared with that of 1891, although less than the average for 1882-92. Farm laborers receive the best wages in the Northern Districts. Domestic servants get an average of $6.21 per per month, which is 4 cents below the average rate of 1891. This class of farm workers are best paid in the Lake Ontario and West Midland groups.

STATISTICS OF

VALUES, RENT AND FARM WAGES.

FARM VALUES—LAND, BUILDINGS AND IMPLEMENTS.

TABLE I. Showing by County Municipalities and groups of Counties the value of Farm Land, Buildings and Implements in Ontario in 1891 and 1892.

Counties.	Farm Lands.		Farm Buildings.		Farm Implements.	
	1892	1891	1892	1891	1892	1891
	$	$	$	$	$	$
Essex	16,767,979	16,954,141	4,411,578	4,407,901	1,247,017	1,197,532
Kent	23,649,544	23,908,174	5,752,541	5,910,490	1,553,414	1,588,136
Elgin	17,339,846	17,367,543	4,979,330	4,804,818	1,276,051	1,274,912
Norfolk	11,881,174	12,284,429	4,249,453	4,054,815	1,107,194	1,085,988
Haldimand	9,399,182	9,583,866	3,590,258	3,532,124	971,647	1,010,761
Welland	8,666,837	8,603,126	3,239,179	3,003,576	788,757	726,623
Totals	87,704,562	88,701,279	26,222,339	25,713,724	6,944,080	6,883,952
Lambton	19,704,874	19,684,305	4,924,419	4,776,311	1,420,751	1,464,439
Huron	29,288,508	29,524,668	8,780,193	8,503,549	2,341,053	2,208,964
Bruce	20,219,485	20,222,039	6,248,633	6,219,530	1,746,910	1,780,930
Totals	69,212,867	69,431,012	19,953,245	19,499,390	5,508,714	5,454,333
Grey	22,029,796	22,669,806	7,333,733	7,292,716	2,203,431	2,227,473
Simcoe	25,979,897	25,702,630	7,506,354	7,337,820	2,141,956	2,064,983
Totals	48,009,693	48,372,436	14,840,087	14,630,536	4,345,387	4,292,456
Middlesex	33,925,004	33,509,147	9,988,430	9,689,282	2,433,436	2,303,340
Oxford	22,110,569	22,367,553	7,367,966	7,217,958	1,636,983	1,729,353
Brant	10,271,143	10,418,317	3,879,925	3,721,721	849,602	861,183
Perth	20,501,444	20,965,735	6,583,203	6,475,137	1,711,545	1,710,217
Wellington	20,928,199	21,094,527	7,063,645	7,161,625	1,735,014	1,718,924
Waterloo	13,743,204	14,433,910	4,973,706	4,948,466	1,178,201	1,158,520
Dufferin	9,041,744	9,213,348	2,475,317	2,444,945	726,444	733,211
Totals	130,521,307	132,002,537	42,332,192	41,659,134	10,271,225	10,214,748
Lincoln	9,146,764	9,418,870	3,728,176	3,602,775	816,281	815,109
Wentworth	13,746,951	13,456,318	4,759,982	4,674,982	1,129,814	1,110,255
Halton	9,938,001	10,137,179	3,537,405	3,420,117	789,631	790,572
Peel	13,630,076	13,521,360	4,408,493	4,094,271	1,054,233	1,081,053
York	30,572,975	31,096,807	8,796,282	8,388,005	1,982,435	1,927,807
Ontario	19,260,241	19,251,022	6,204,504	5,824,528	1,505,939	1,456,725
Durham	14,561,995	14,304,217	4,619,031	4,381,328	1,093,098	1,094,182
Northumberland	14,075,379	14,090,305	5,024,493	4,749,325	1,290,954	1,156,755
Prince Edward	8,195,501	8,317,712	3,061,984	3,031,016	787,539	763,384
Totals	133,127,883	133,593,790	44,140,350	42,166,347	10,449,924	10,195,842
Lennox and Addington	8,616,427	8,415,192	3,208,897	3,300,385	773,258	759,087
Frontenac	8,373,418	8,496,832	2,946,509	2,878,080	840,313	860,393
Leeds and Grenville	18,568,511	18,891,530	6,774,527	6,482,460	1,618,060	1,637,614
Dundas	7,956,422	8,546,250	2,635,167	2,587,442	709,966	756,900
Stormont	6,051,072	6,496,712	2,210,171	2,372,064	557,894	583,694
Glengarry	6,850,894	6,864,460	2,561,486	2,496,503	748,892	765,738
Prescott	6,867,920	6,494,605	2,223,206	2,228,556	632,147	630,323
Russell	4,277,553	4,380,554	1,236,888	1,223,292	427,679	396,449
Carleton	18,726,714	19,244,547	4,830,863	4,683,507	1,409,642	1,447,062
Renfrew	7,750,256	7,556,878	2,795,358	2,955,933	959,017	956,988
Lanark	8,937,641	8,656,303	3,332,802	3,235,479	900,476	949,922
Totals	102,976,828	104,043,863	34,755,874	34,443,701	9,577,344	9,744,170
Victoria	11,632,664	12,143,774	3,355,372	3,272,778	999,255	951,221
Peterborough	10,411,553	10,041,203	3,078,118	3,164,673	810,923	847,351
Haliburton	1,066,625	1,088,740	294,987	303,233	95,061	96,700
Hastings	15,040,011	15,666,273	4,930,726	4,710,540	1,399,595	1,382,887
Totals	38,150,853	38,939,990	11,659,203	11,451,224	3,304,834	3,278,159
Muskoka	1,976,804	1,912,181	641,845	639.047	208,718	211,759
Parry Sound	1,626,602	1,710,646	439,955	460,110	155,319	153,026
Nipissing	485,639	468,111	126,175	123,030	38,702	36,990
Algoma	2,035,433	2,069,378	532,993	482,084	198.773	186,007
Totals	6,124,478	6,100,316	1,740,968	1,704,271	601,512	587,782
The Province	615,828,471	621,245,223	195,644,258	191,268,327	51,003,020	50,651,442

FARM VALUES—LIVE STOCK AND TOTAL PROPERTY—RENTALS.

TABLE II. Showing by County Municipalities and groups of Counties the values of Farm Live Stock and total Farm Property in Ontario in 1891 and 1892; also the rent per acre of leased farms as reported in 1892, with the average derived for the seven years 1886-92.

Counties.	Farm Live Stock.		Total Farm Property.		Rent per acre on land -			
					Occupied.		Cleared.	
	1892	1891	1892	1891	1892	1886-92	1892	1886-92
	$	$	$	$	$ c.	$ c.	$ c.	$ c.
Essex	2,499,196	2,463,617	24,925,770	25,023,191	2 88	2 12	3 85	3 22
Kent	3,408,323	3,430,057	34,363,822	34,836,857	2 70	2 60	3 64	3 64
Elgin	3,230,798	2,794,325	26,826,025	26,241,598	2 46	2 26	3 29	3 11
Norfolk	2,221,749	1,954,512	19,459,570	19,379,744	2 08	1 87	2 84	2 57
Haldimand	1,839,674	1,761,978	15,800,761	15,888,729	1 73	1 83	2 26	2 35
Welland	1,458,364	1,347,071	14,153,137	13,680,396	2 37	2 06	2 92	2 56
Totals	14,658,104	13,751,560	135,529,085	135,050,515	2 30	2 15	3 03	2 94
Lambton	3,547,399	3,200,778	29,597,443	29,125,833	1 88	1 88	2 91	2 84
Huron	6,470,090	6,039,054	46,879,844	46,276,235	2 29	2 15	2 79	2 77
Bruce	4,745,373	4,309,153	32,960,401	32,531,652	1 71	1 71	2 14	2 31
Totals	14,762,862	13,548,985	109,437,688	107,933,720	1 98	1 93	2 55	2 61
Grey	5,824,392	5,189,055	37,391,352	37,379,050	1 33	1 30	1 85	1 90
Simcoe	4,859,435	4,286,257	40,487,642	39,391,690	2 15	1 92	2 68	2 59
Totals	10,683,827	9,475,312	77,878,994	76,770,740	1 67	1 57	2 22	2 24
Middlesex	6,296,498	6,303,952	52,643,368	51,805,721	2 59	2 55	3 21	3 32
Oxford	3,972,994	3,916,109	35,088,512	35,230,973	2 87	2 72	3 62	3 53
Brant	1,651,260	1,570,649	16,651,930	16,571,870	3 01	2 80	3 55	3 39
Perth	4,281,713	3,996,570	33,077,905	33,147,659	2 44	2 34	3 06	2 96
Wellington	4,476,520	4,248,985	34,203,378	34,224,061	2 00	2 00	2 62	2 58
Waterloo	2,250,437	2,263,608	22,145,548	22,804,504	2 25	2 24	2 88	2 83
Dufferin	1,841,314	1,655,992	14,084,819	14,047,496	1 72	1 53	2 24	2 20
Totals	24,770,736	23,955,865	207,895,460	207,832,284	2 43	2 31	3 06	3 00
Lincoln	1,469,142	1,402,369	15,160,363	15,239,123	2 08	2 32	2 68	2 85
Wentworth	2,134,848	2,095,226	21,771,595	21,336,781	3 60	2 83	4 07	3 50
Halton	1,649,872	1,492,331	15,914,909	15,840,199	2 21	2 30	2 92	2 94
Peel	2,272,167	2,144,128	21,364,969	20,840,812	2 74	2 72	3 18	3 28
York	4,114,091	3,931,303	45,465,783	45,343,922	3 04	3 11	3 64	3 76
Ontario	3,720,520	3,575,304	30,691,204	30,107,579	2 82	2 81	3 43	3 45
Durham	2,546,825	2,268,398	22,820,949	22,048,125	2 55	2 80	3 07	3 36
Northumberland	2,702,851	2,487,156	23,093,677	22,483,541	1 89	2 04	2 56	2 55
Prince Edward	1,460,205	1,403,466	13,505,229	13,515,578	1 94	2 13	2 22	2 63
Totals	22,070,521	20,799,681	209,788,678	206,755,660	2 59	2 66	3 16	3 25
Lennox & Addington	1,727,942	1,633,498	14,326,524	14,108,162	1 59	1 57	2 54	2 35
Frontenac	1,693,523	1,583,605	13,853,763	13,818,910	78	1 20	1 30	1 84
Leeds and Grenville	3,494,285	3,362,963	30,455,383	30,374,567	1 51	1 40	2 15	2 16
Dundas	1,361,707	1,272,917	12,663,262	13,163,509	1 43	1 65	2 91	2 61
Stormont	1,101,693	1,143,149	9,920,830	10,595,619	1 28	1 47	2 00	2 21
Glengarry	1,487,202	1,311,306	11,648,474	11,438,007	1 23	1 39	2 10	2 30
Prescott	1,247,827	1,112,521	10,971,100	10,466,005	1 64	1 58	2 38	2 28
Russell	1,019,458	820,016	6,961,578	6,820,311	1 15	1 25	2 26	2 20
Carleton	2,869,477	2,396,921	27,836,696	27,772,037	1 58	1 77	2 53	2 57
Renfrew	2,414,732	2,197,568	13,919,363	13,667,367	1 05	80	1 70	1 67
Lanark	2,360,302	2,003,373	15,531,221	14,845,077	74	82	1 11	1 35
Totals	20,778,148	18,837,837	168,088,194	167,069,571	1 33	1 34	2 11	2 15
Victoria	2,694,670	2,064,985	18,681,961	18,432,758	1 27	1 77	2 21	2 69
Peterborough	1,903,324	1,734,941	16,203,918	15,788,168	1 23	1 25	2 06	2 05
Haliburton	280,452	288,167	1,737,125	1,776,840	28	33	1 23	1 46
Hastings	3,030,244	2,701,951	24,400,576	24,461,651	1 35	1 75	1 99	2 59
Totals	7,908,690	6,790,044	61,023,580	60,459,417	1 20	1 50	2 08	2 45
Muskoka	601,054	518,378	3,428,421	3,281,365	35	33	1 69	1 65
Parry Sound	487,679	433,192	2,709,555	2,756,974	39	15	1 96	1 83
Nipissing	141,853	106,110	792,369	734,241	51	44	3 53	2 56
Algoma	638,021	504,112	3,405,220	3,241,581	83	63	2 00	1 73
Totals	1,868,607	1,561,792	10,335,565	10,014,161	42	44	1 96	1 77
The Province	117,501,495	108,721,076	979,977,244	971,886,068	1 98	2 01	2 74	2 80

FARM VALUES—AVERAGE PER ACRE.

TABLE III. Showing by County Municipalities and groups of Counties the average value per acre occupied of Farm Land, Buildings, Implements and Live Stock in Ontario for the years 1891 and 1892.

Counties.	Land.		Buildings.		Implements.		Live Stock.		Total Property.	
	1892.	1891.	1892.	1891.	1892.	1891.	1892.	1891.	1892.	1891.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	39 06	39 78	10 28	10 34	2 90	2 81	5 82	5 78	58 06	58 71
Kent	41 68	42 14	10 14	10 42	2 74	2 80	6 01	6 04	60 57	61 40
Elgin	39 68	39 81	11 39	11 01	2 92	2 92	7 39	6 40	61 38	60 14
Norfolk	30 11	31 34	10 77	10 34	2 80	2 77	5 63	4 98	49 31	49 43
Haldimand	33 60	34 23	12 83	12 61	3 47	3 61	6 58	6 29	56 48	56 74
Welland	37 97	37 84	14 19	13 21	3 45	3 20	6 39	5 92	62 00	60 17
Totals	37 54	38 08	11 22	11 04	2 97	2 96	6 28	5 90	58 01	57 98
Lambton	29 77	29 78	7 44	7 23	2 15	2 21	5 36	4 84	44 72	44 06
Huron	36 67	37 13	11 00	10 69	2 93	2 78	8 10	7 59	58 70	58 19
Bruce	24 21	24 76	7 48	7 62	2 09	2 18	5 68	5 28	39 46	39 84
Totals	30 15	30 55	8 69	8 58	2 40	2 40	6 43	5 96	47 67	47 49
Grey	20 75	21 42	6 91	6 89	2 07	2 11	5 49	4 90	35 22	35 32
Simcoe	26 99	26 73	7 80	7 63	2 23	2 15	5 05	4 46	42 07	40 97
Totals	23 72	23 95	7 33	7 24	2 15	2 13	5 28	4 69	38 48	38 01
Middlesex	44 79	44 19	13 19	12 78	3 21	3 04	8 31	8 31	69 50	68 32
Oxford	46 75	47 39	15 58	15 29	3 46	3 67	8 40	8 30	74 19	74 65
Brant	47 56	48 16	17 97	17 21	3 93	3 98	7 65	7 26	77 11	76 61
Perth	39 58	40 66	12 71	12 56	3 31	3 31	8 27	7 75	63 87	64 28
Wellington	33 37	33 65	11 26	11 42	2 77	2 74	7 14	6 78	54 54	54 59
Waterloo	44 78	47 02	16 21	16 12	3 84	3 77	7 33	7 38	72 16	74 29
Dufferin	25 33	25 90	6 94	6 87	2 04	2 06	5 16	4 65	39 47	39 48
Totals	40 10	40 59	13 00	12 81	3 16	3 14	7 61	7 37	63 87	63 91
Lincoln	47 88	49 37	19 52	18 88	4 27	4 27	7 69	7 35	79 36	79 87
Wentworth	50 58	49 25	17 51	17 11	4 16	4 06	7 86	7 67	80 11	78 09
Halton	44 24	45 30	15 75	15 28	3 52	3 53	7 34	6 67	70 85	70 78
Peel	47 27	46 96	15 29	14 22	3 66	3 76	7 88	7 45	74 10	72 39
York	57 11	58 27	16 43	15 72	3 70	3 61	7 69	7 37	84 93	84 97
Ontario	38 26	38 37	12 33	11 61	2 99	2 90	7 39	7 13	60 97	60 01
Durham	39 43	38 85	12 51	11 90	2 96	2 97	6 89	6 16	61 79	59 88
Northumberland	32 36	32 47	11 55	10 94	2 97	2 66	6 22	5 73	53 10	51 80
Prince Edward	35 86	36 12	13 40	13 16	3 45	3 32	6 39	6 10	59 10	58 70
Totals	43 69	43 90	14 49	13 85	3 43	3 35	7 24	6 83	68 85	67 93
Lennox and Addington	20 07	19 97	7 47	7 83	1 80	1 80	4 02	3 88	33 36	33 48
Frontenac	12 31	12 60	4 33	4 27	1 24	1 28	2 49	2 35	20 37	20 50
Leeds and Grenville	24 95	25 25	9 10	8 67	2 18	2 19	4 70	4 49	40 93	40 60
Dundas	33 45	36 15	11 08	10 94	2 98	3 20	5 73	5 38	53 24	55 67
Stormont	24 15	25 61	8 82	9 35	2 22	2 30	4 40	4 51	39 59	41 77
Glengarry	23 83	23 76	8 91	8 64	2 61	2 65	5 17	4 54	40 52	39 59
Prescott	23 88	22 77	7 73	7 82	2 20	2 21	4 34	3 90	38 15	36 70
Russell	16 94	17 32	4 90	4 84	1 69	1 57	4 03	3 24	27 56	26 97
Carleton	33 23	34 25	8 57	8 34	2 50	2 57	5 09	4 27	49 39	49 43
Renfrew	8 52	8 26	3 07	3 23	1 05	1 04	2 66	2 40	15 30	14 93
Lanark	13 38	12 91	4 99	4 83	1 55	1 42	3 53	2 99	23 25	22 15
Totals	19 39	19 60	6 54	6 49	1 80	1 84	3 91	3 55	31 64	31 48
Victoria	19 97	21 25	5 76	5 73	1 72	1 66	4 62	3 61	32 07	32 25
Peterborough	19 16	18 71	5 67	5 89	1 49	2 58	3 50	3 23	29 82	29 41
Haliburton	1 90	1 93	52	54	0 17	17	50	51	3 09	3 15
Hastings	15 35	15 97	5 03	4 80	1 43	1 41	3 09	2 76	24 90	24 94
Totals	14 29	14 68	4 37	4 32	1 24	1 23	2 96	2 56	22 86	22 79
Muskoka	3 82	3 72	1 24	1 24	41	41	1 16	1 01	6 63	6 38
Parry Sound	3 29	3 36	89	90	31	30	99	85	5 48	5 41
Nipissing	2 40	2 68	63	70	19	21	70	61	3 92	4 20
Algoma	4 11	4 49	1 08	1 05	40	40	1 29	1 09	6 88	7 03
Totals	3 59	3 72	1 02	1 03	35	35	1 09	0 94	6 05	6 04
The Province	27 19	27 57	8 64	8 49	2 25	2 25	5 19	4 82	43 27	43 13

VALUES—LIVE STOCK.

TABLE IV. Showing by County Municipalities and groups of Counties the value of Horses, Milch Cows other Cattle and the total Cattle, Sheep, Hogs and Poultry for the year 1892.

Counties.	Horses.	Cattle.			Sheep.	Hogs.	Poultry.
		Milch cows.	Other cattle.	Total.			
	$	$	$	$	$	$	$
Essex	1,413,434	380,656	332,468	713,124	113,864	204,398	54,376
Kent	1,875,233	450,656	623,561	1,074,217	167,120	242,608	49,145
Elgin	1,465,739	557,446	744,350	1,301,796	227,436	192,188	43,639
Norfolk	1,231,086	370,558	272,217	642,775	164,084	153,150	30,654
Haldimand	967,272	342,848	266,788	609,636	134,717	90,149	37,900
Welland	829,320	246,552	193,617	440,169	107,146	52,028	29,701
Totals	7,782,084	2,348,716	2,433,001	4,781,717	914,367	934,521	245,415
Lambton	1,539,772	544,389	1,006,711	1,551,100	281,846	124,368	50,313
Huron	2,840,014	952,987	1,775,577	2,728,564	599,009	213,890	88,613
Bruce	1,862,288	770,971	1,332,024	2,102,995	541,963	173,992	64,135
Totals	6,242,074	2,268,347	4,114,312	6,382,659	1,422,818	512,250	203,061
Grey	2,496,479	1,025,480	1,336,437	2,361,917	658,066	217,396	90,534
Simcoe	2,413,572	738,684	946,749	1,685,433	401,973	265,245	93,212
Totals	4,910,051	1,764,164	2,283,186	4,047,350	1,060,039	482,641	183,746
Middlesex	2,744,645	1,147,511	1,668,286	2,815,797	391,797	239,934	104,325
Oxford	1,648,801	1,109,984	801,984	1,911,968	145,605	213,089	53,531
Brant	839,913	347,042	230,030	577,072	99,970	107,127	27,178
Perth	1,923,410	880,101	956,044	1,836,145	273,111	182,740	66,307
Wellington	1,959,609	865,877	945,519	1,811,396	435,856	205,450	64,209
Waterloo	1,097,721	425,817	402,152	827,969	187,796	94,320	42,631
Dufferin	837,312	304,842	411,291	716,133	157,176	96,908	33,785
Totals	11,051,411	5,081,174	5,415,306	10,496,480	1,691,311	1,139,568	391,966
Lincoln	866,953	245,686	157,084	402,770	104,801	67,301	27,317
Wentworth	1,155,313	480,873	247,599	728,472	123,086	93,244	34,733
Halton	790,363	354,909	306,094	661,003	100,217	60,380	37,909
Peel	1,214,693	450,621	307,040	757,661	141,333	109,236	49,244
York	2,496,208	671,625	404,264	1,075,889	256,906	200,505	84,583
Ontario	1,858,215	700,330	671,634	1,371,964	271,223	159,715	59,403
Durham	1,400,494	408,482	387,037	795,519	179,368	114,583	56,861
Northumberland	1,365,157	621,437	374,814	996,251	145,224	143,651	52,568
Prince Edward	900,361	303,573	116,252	419,825	50,282	63,912	25,825
Totals	12,047,757	4,237,536	2,971,818	7,209,354	1,372,440	1,012,527	428,443
Lennox and Addington	781,899	401,473	353,684	755,157	99,510	60,237	31,139
Frontenac	719,629	450,367	291,603	741,970	114,328	75,840	41,756
Leeds and Grenville	1,352,262	1,305,131	392,059	1,697,190	186,575	190,766	67,492
Dundas	686,982	410,845	119,400	530,245	44,707	67,274	32,499
Stormont	512,043	359,835	93,286	453,121	60,524	52,129	23,876
Glengarry	683,354	462,481	170,188	632,669	79,103	61,168	30,908
Prescott	563,203	386,075	144,724	530,799	61,313	63,845	28,667
Russell	439,599	246,604	207,593	454,197	61,716	40,578	23,368
Carleton	1,335,005	668,940	500,437	1,169,377	170,188	118,752	76,155
Renfrew	1,162,413	451,649	402,932	854,581	237,314	114,300	46,124
Lanark	903,301	622,724	430,454	1,053,178	250,272	89,306	64,245
Totals	9,139,690	5,766,124	3,106,360	8,872,484	1,365,550	934,195	466,229
Victoria	1,392,194	378,899	535,737	914,636	254,672	93,480	39,688
Peterborough	926,143	431,407	289,592	720,999	123,303	94,552	38,327
Haliburton	108,916	61,750	65,151	126,901	26,896	13,331	4,408
Hastings	1,374,430	912,146	350,090	1,262,236	164,034	175,046	54,498
Totals	3,801,683	1,784,202	1,240,570	3,024,772	568,905	376,409	136,921
Muskoka	279,204	113,965	118,078	232,043	52,934	24,296	12,577
Parry Sound	199,053	97,668	113,473	211,141	45,492	24,175	7,818
Nipissing	90,082	22,858	15,350	38,208	4,109	6,351	3,103
Algoma	269,831	110,251	142,016	252,267	71,592	32,160	12,171
Totals	838,170	344,742	388,917	733,659	174,127	86,982	35,669
The Province	55,812,920	23,595,005	21,953,470	45,548,475	8,569,557	5,479,093	2,091,450

VALUES OF LIVE STOCK SOLD IN YEAR.

TABLE V. Showing by County Municipalities and groups of Counties the value of Live Stock sold or killed in the year ending June 30, 1892.

Counties.	Horses.	Cattle.	Sheep.	Hogs.	Poultry.	Total.
	$	$	$	$	$	$
Essex	85,701	225,910	33,068	368,036	21,425	734,140
Kent	116,412	418,504	65,825	396,273	26,670	1,023,684
Elgin	157,044	435,679	96,831	328,625	22,731	1,040,910
Norfolk	107,254	149,513	42,193	232,783	12,162	543,905
Haldimand	71,832	125,159	56,413	139,205	20,084	412,693
Welland	42,656	163,189	45,324	91,816	11,729	360,714
Totals	580,899	1,523,954	339,654	1,556,738	114,801	4,116,046
Lambton	113,080	697,262	72,708	157,103	15,944	1,056,097
Huron	483,306	1,417,186	198,454	399,340	26,868	2,525,154
Bruce	225,192	901,309	134,879	248,930	17,153	1,527,463
Totals	821,578	3,015,757	406,041	805,373	59,965	5,108,714
Grey	128,216	808,690	177,371	335,788	22,989	1,473,054
Simcoe	172,584	591,384	121,766	352,506	28,508	1,266,748
Totals	300,800	1,400,074	299,137	688,294	51,497	2,739,802
Middlesex	237,975	1,275,732	118 673	445,310	44,261	2,121,951
Oxford	149,682	779,870	57,368	450,522	17,467	1,454,909
Brant	49,590	366,225	51,244	182,919	11,224	661,202
Perth	168,514	770,806	91,674	332,416	21,814	1,385,224
Wellington	150,300	922,352	137,226	431,048	19,830	1,660,756
Waterloo	80,925	607,472	87,105	220,670	10,882	1,007,054
Dufferin	52,128	235.679	30,860	127,825	11,698	458,190
Totals	889,114	4,958,136	577,150	2,190,710	137,176	8,752,286
Lincoln	56,400	144,179	35,957	98,856	11,410	346,802
Wentworth	66,555	172,116	47,411	175,694	23,555	485,331
Halton	59,551	218,149	30,262	96,944	20,735	425,641
Peel	96,192	243,735	43,082	187,825	31,272	602,106
York	203,425	575,456	94,560	378,181	33,722	1,285,344
Ontario	173,242	601,200	84,002	282,943	24,520	1,165,907
Durham	84,272	275,643	38,233	165,042	22,129	585,319
Northumberland	104,497	245,185	36,583	191,718	13,028	591,011
Prince Edward	32,376	65,050	15,323	77,344	8,822	198,915
Totals	876,510	2,540,713	425,413	1,654,547	189,193	5,686,376
Lennox and Addington	43,428	109,538	22,468	97,757	14,043	287,234
Frontenac	27,956	176,491	37,982	101,169	22,108	365,706
Leeds and Grenville	64,020	232,178	66,442	222,481	24,914	610,035
Dundas	84,732	70,240	19,189	77,587	7,806	259,554
Stormont	31,392	58,447	13,847	60,844	6,168	170,698
Glengarry	63,510	96,043	20,573	68,796	6,635	255,557
Prescott	38,962	64,458	16,163	74,915	8,685	203,183
Russell	26,856	78,617	17,009	49,243	10,418	182,143
Carleton	62,016	280,959	48,503	138,661	29,728	559,867
Renfrew	61,008	214,147	63,309	130,190	15,901	484,555
Lanark	72,160	234,231	71,647	154,416	22,902	555,356
Totals	576,040	1,615,349	397,132	1,176,059	169,308	3,933,888
Victoria	65,124	292,861	59,618	159,025	13,102	589,730
Peterborough	30,104	204,004	33,868	134,371	14,651	416,998
Haliburton	8,732	31,046	8,235	17,048	919	65,980
Hastings	66,024	205,466	48,595	265,530	15,973	601,588
Totals	169,984	733,377	150,316	575,974	44,645	1,674,296
Muskoka	21,975	55,290	15,265	30,490	3,288	126,308
Parry Sound	24,823	55,057	13,077	35,739	2,104	130,800
Nipissing	2,925	10,922	1,005	6,675	1,264	22,791
Algoma	15,484	70,506	16,000	55,253	5,067	162,310
Totals	65,207	191,775	45,347	128,157	11,723	442,209
The Province	4,280,132	15,979,135	2,640,190	8,775,852	778,308	32,453,617

VALUES—LIVE STOCK PER HEAD.

TABLE VI. Showing by County Municipalities and groups of Counties the value per head of the several classes of Horses and Cattle in the Province for the year 1892, and also the value per head of all horses and cattle sold for the same period.

Counties.	Horses.					Cattle.				
	Working horses.	Breeding mares.	Colts.	Stallions.	Horses sold in year.	Working oxen.	Milch cows.	Store cattle.	Other cattle.	Cattle sold in year.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	87 62	90 76	51 65	200 00	77 00	39 17	28 61	22 44	11 16	28 56
Kent	89 30	87 73	56 65	350 00	89 00	40 00	28 42	25 02	12 68	30 30
Elgin	91 46	92 85	58 60	477 78	92 00	61 20	32 20	34 75	15 44	37 78
Norfolk	86 04	89 05	58 81	480 00	94 00	57 22	26 73	20 89	11 32	24 08
Haldimand	88 58	90 02	52 94	500 00	82 00	57 57	28 76	33 48	12 85	24 73
Welland	92 43	85 96	57 78	250 00	86 00	49 29	29 68	24 95	13 43	31 21
Group	89 26	89 53	56 00	382 20	87 47	50 20	29 15	26 60	12 96	30 51
Lambton	87 36	85 00	56 90	575 00	88 00	50 00	31 14	34 93	14 53	39 34
Huron	93 38	106 41	55 87	445 00	109 00	53 50	32 94	32 55	15 84	44 56
Bruce	92 23	94 56	56 25	370 00	88 00	55 17	31 02	32 15	13 20	40 75
Group	91 45	97 89	56 22	483 05	99 25	53 69	31 83	32 98	14 61	42 09
Grey	89 11	88 10	52 99	459 00	88 00	55 56	29 82	26 60	12 40	37 05
Simcoe	92 89	100 31	57 82	220 83	94 00	50 00	30 04	24 95	13 14	33 09
Group	90 93	93 95	55 42	392 60	91 35	54 19	29 91	25 86	12 69	35 27
Middlesex	90 13	97 85	60 66	550 00	95 00	53 23	33 81	34 64	15 95	42 54
Oxford	87 46	90 43	56 94	375 00	101 00	40 00	33 05	32 07	13 78	51 26
Brant	86 21	86 97	59 74	330 00	87 00	60 00	32 58	26 68	14 08	57 08
Perth	90 29	101 19	59 89	453 33	109 00	50 00	32 82	29 27	14 48	41 60
Wellington	85 45	90 65	52 58	506 25	90 00	56 52	36 36	27 93	14 96	45 34
Waterloo	84 66	88 97	53 98	415 00	83 00	60 00	32 52	34 37	15 43	46 15
Dufferin	87 35	90 10	47 75	300 00	72 00	50 00	30 09	24 74	12 79	28 78
Group	87 69	93 62	56 86	459 92	93 87	51 46	33 42	30 96	14 73	44 33
Lincoln	92 71	89 00	60 82	333 33	94 00	52 25	32 78	24 48	13 35	33 46
Wentworth	95 26	108 71	64 77	360 00	87 00	61 25	34 66	29 30	14 81	31 22
Halton	99 65	92 50	62 72	200 00	113 00	72 50	36 23	33 28	16 58	40 99
Peel	94 63	103 90	61 70	300 00	96 00	57 50	35 58	24 63	17 94	36 98
York	99 77	105 30	62 07	542 86	103 00	.....	35 96	24 01	15 51	39 94
Ontario	92 08	108 69	58 25	350 00	94 00	50 00	39 98	25 64	17 23	43 88
Durham	90 51	103 15	53 83	487 50	92 00	50 00	33 37	25 31	13 68	38 46
Northumberland	82 26	79 33	50 37	400 00	83 00	55 00	28 56	21 17	11 15	28 69
Prince Edward	79 45	79 33	46 56	203 13	76 00	50 00	25 22	19 85	9 86	22 40
Group	91 94	99 24	57 60	396 59	94 12	58 28	33 61	25 06	14 69	37 11
Lennox and Addington	81 59	73 86	45 20	310 00	84 00	48 75	25 94	26 79	11 13	24 17
Frontenac	81 90	74 21	44 60	416 67	58 00	44 17	26 66	25 16	10 61	26 58
Leeds and Grenville	78 50	66 27	46 00	270 00	66 00	30 00	27 32	19 23	10 61	23 10
Dundas	77 85	91 45	47 93	375 00	92 00	30 00	25 23	18 19	9 17	23 32
Stormont	74 78	81 95	43 38	...	72 00	32 50	23 00	14 47	8 62	20 21
Glengarry	73 96	88 81	44 51	312 50	87 00	.....	24 77	20 68	11 69	25 07
Prescott	75 07	82 69	42 00	200 00	77 00	32 50	25 27	17 80	10 63	25 12
Russell	89 74	93 78	47 12	300 00	72 00	32 50	32 92	20 00	22 05	31 79
Carleton	91 68	99 07	55 43	315 00	96 00	... ..	28 63	22 97	15 46	32 15
Renfrew	92 51	101 81	53 53	327 14	93 00	.....	24 79	20 30	10 19	26 93
Lanark	84 17	83 36	47 40	.. .	88 00	35 00	26 66	21 59	11 35	28 19
Group	82 59	85 14	47 51	323 70	81 63	41 64	26 40	21 58	11 75	26 48
Victoria	90 51	94 50	49 79	700 00	81 00	50 00	29 20	23 82	12 45	35 17
Peterborough	87 28	84 84	52 33	550 00	71 00	40 00	27 77	22 18	11 37	29 37
Haliburton	78 90	81 41	42 74	200 00	74 00	43 33	24 33	19 31	8 53	21 62
Hastings	85 83	74 83	50 62	262 50	84 00	40 00	24 70	17 25	10 14	22 47
Group	87 42	85 87	50 49	476 80	79 73	41 46	26 25	21 45	11 14	28 37
Muskoka	97 52	92 18	50 05	575 00	75 00	42 16	27 31	19 06	9 67	22 80
Parry Sound	100 71	106 33	52 89	186 67	103 00	45 08	27 52	20 00	9 12	22 95
Nipissing	101 83	145 00	73 75	250 00	75 00	37 50	28 36	18 96	9 74	23 64
Algoma	105 88	95 87	59 63	366 67	79 00	46 70	27 75	23 87	11 41	26 89
Group	101 26	101 41	55 13	358 01	84 79	44 71	27 58	20 70	10 11	24 25
The Province	88 69	92 87	54 63	407 05	91 15	48 49	29 95	27 42	13 37	36 62

VALUE LIVE STOCK PER HEAD.

TABLE VII. Showing by County Municipalities and groups of Counties the value per head of Sheep, Hogs and Poultry in the Province for the year 1892, and also the value of each per head sold for the same period.

Counties.	Sheep.			Hogs.			Poultry.			
	Over 1 year.	Under 1 year.	Sold in year.	Over 1 year.	Under 1 year.	Sold in year.	Turkeys	Geese.	Other Fowls.	Sold in year.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	cts.	cts.	cts.	cts.
Essex	4 52	2 65	3 49	7 13	2 99	9 04	60	51	22	27
Kent	5 47	3 11	4 81	9 58	3 97	8 80	62	43	22	42
Elgin	5 34	3 39	5 02	10 42	4 50	9 13	66	64	21	38
Norfolk	5 44	3 78	4 44	8 84	4 37	8 26	57	36	19	30
Haldimand	5 59	3 66	4 64	10 64	4 40	8 94	81	55	24	43
Welland	5 16	3 56	4 05	11 18	4 85	8 89	80	78	25	32
Group	5 28	3 34	4 51	9 04	3 94	8 85	66	52	22	35
Lambton	5 79	3 85	4 58	11 09	4 20	8 83	51	53	22	34
Huron	6 44	4 26	5 61	11 58	4 48	9 05	50	46	21	36
Bruce	5 90	3 93	4 54	9 89	4 03	8 59	62	50	23	33
Group	6 09	4 04	5 02	10 76	4 26	8 86	54	48	22	35
Grey	5 44	3 65	4 67	9 62	3 68	7 93	62	57	22	31
Simcoe	5 51	3 35	4 31	9 70	3 64	8 40	72	57	25	35
Group	5 47	3 54	4 52	9 66	3 66	8 16	67	57	23	33
Middlesex	6 43	3 99	4 96	10 94	4 42	8 94	63	58	24	42
Oxford	5 99	3 70	5 36	13 23	4 67	8 92	62	61	23	39
Brant	6 26	3 98	6 05	13 59	5 04	9 25	80	62	24	34
Perth	5 99	3 85	5 01	9 87	4 43	9 53	68	51	22	45
Wellington	5 99	3 82	5 12	12 01	3 96	8 86	56	50	22	42
Waterloo	5 89	3 94	5 87	10 86	4 76	9 47	58	60	23	28
Dufferin	5 34	3 59	4 14	9 48	3 44	7 61	47	53	23	42
Group	6 02	3 85	5 20	11 21	4 37	8 99	61	55	23	40
Lincoln	5 77	3 99	4 52	12 72	4 52	8 35	62	73	25	37
Wentworth	5 85	3 55	4 91	14 11	4 53	8 40	63	64	26	65
Halton	6 71	3 81	4 78	12 97	4 15	7 38	91	71	27	53
Peel	6 36	3 85	4 66	12 62	3 70	8 15	69	61	25	54
York	6 78	4 00	5 33	11 91	3 90	8 03	74	71	27	40
Ontario	7 77	4 13	5 73	10 61	3 61	7 97	90	57	22	40
Durham	6 69	3 48	4 74	10 69	4 19	8 33	73	64	23	44
Northumberland	5 24	3 28	3 94	11 55	4 16	9 29	73	60	22	33
Prince Edward	4 39	2 91	3 85	10 66	5 44	8 06	65	55	23	33
Group	6 41	3 73	4 89	11 69	4 08	8 21	74	64	24	44
Lennox and Addington	4 81	3 17	3 35	10 43	5 12	10 36	69	58	26	41
Frontenac	4 89	3 28	4 30	10 67	4 34	10 93	68	63	33	48
Leeds and Grenville	4 12	3 00	3 71	12 89	3 50	11 22	67	59	21	42
Dundas	4 75	3 01	3 57	12 58	3 38	10 17	52	59	21	33
Stormont	4 31	3 78	4 33	12 60	4 52	13 92	88	64	22	41
Glengarry	4 70	3 05	3 61	11 92	4 09	11 77	67	53	30	34
Prescott	3 97	2 85	3 31	10 90	2 73	15 27	65	58	28	40
Russell	5 12	3 13	4 66	11 78	3 05	11 86	75	63	28	49
Carleton	4 83	3 07	3 84	12 48	3 36	10 48	78	59	26	51
Renfrew	4 12	2 95	3 61	9 89	2 69	10 00	68	52	27	42
Lanark	4 44	3 04	3 70	11 69	2 78	11 15	77	63	28	52
Group	4 46	3 07	3 75	11 62	3 46	11 07	70	59	26	44
Victoria	7 10	3 81	4 10	8 18	3 54	9 45	52	59	23	34
Peterborough	5 14	3 03	4 00	9 83	3 22	9 10	51	51	23	51
Haliburton	4 50	2 93	3 59	8 79	2 93	9 25	60	49	22	27
Hastings	4 50	2 95	3 63	9 93	3 87	9 24	58	59	26	32
Group	5 60	3 27	3 89	9 45	3 57	9 26	53	56	24	37
Muskoka	5 18	2 92	4 12	10 63	3 40	6 99	58	84	25	31
Parry Sound	5 12	2 97	4 46	10 23	3 56	8 55	66	80	23	30
Nipissing	4 35	3 00	3 15	7 93	3 17	11 41	61	73	28	45
Algoma	5 09	3 05	4 00	9 12	3 62	11 26	57	66	25	30
Group	5 10	2 99	4 14	9 66	3 52	9 13	59	74	25	31
The Province	5 58	3 56	4 58	10 59	3 96	8 97	66	57	24	40

MARKET PRICES.

TABLE VIII. Showing the average price of Agricultural Products at the leading markets of Ontario for July-December, 1892, and the average for the half year and for the Province.

Products.	Belleville.	Brantford.	Brockville.	Chatham.	Cobourg.	Guelph.	Kingston.	Lindsay.	London.	Ottawa.	Peterborough.	St. Thomas.	Stratford.	Toronto.	The Province.
	cts.	cts.	cts.	cts	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.
FALL WHEAT: per bush.															
July	78.4	75.9	....	74.1	....	77.4	78.0	75.0	75.2	82.5	78.1	75.0	75.3	79.5	77.5
August	75.0	72.5	..	71.2	....	74.7	76.6	75.0	73.3	82.5	78.0	73.1	73.1	79.3	76.2
September	73.9	67.7	79.0	65.9	....	70.8	70.1	68.2	69.9	69.2	73.4	69.4	69.5	74.3	71.6
October	72.8	64.9	79.0	61.9	....	65.6	67.4	65.0	65.3	70.8	69.0	64.9	64.1	69.4	67.7
November	65.3	65.6	79.0	62.0	65.0	66.0	68.0	63.0	64.8	67.5	66.9	64.3	64.9	69.0	67.0
December	64.7	62.1	79.0	61.6	65.0	64.5	67.0	61.8	63.0	70.1	64.8	62.0	61.8	65.9	64.9
Average	71.8	68.1	79.0	66.1	65.0	69.8	71.0	68.2	68.7	73.4	71.5	67.8	67.9	72.8	70.7
SPRING WHEAT: per bush.															
July	77.0	76.8	....	74.0	....	67.8	76.7	74.0	75.2	82.5	76.0	75.0	75.3	73.7	74.5
August	78.0	72.5		72.5	....	66.0	76.8	74.0	73.9	82.5	74.9	73.1	75.0	72.0	73.2
September	76.4	68.8	79.0	67.0	....	63.9	69.7	67.7	70.8	73.0	70.9	69.4	70.1	68.6	69.6
October	....	65.2	79.0	62.0	...	59.0	66.9	63.5	64.5	68.8	66.0	64.9	64.1	63.0	64.4
November	65.3	65.8	79.0	62.0	60.7	59.3	67.5	61.5	63.8	67.5	65.0	64.3	64.9	62.2	63.5
December	64.7	61.9	79.0	61.5	60.0	58.1	63.3	61.5	61.7	66.8	61.8	62.0	61.8	60.2	62.0
Average	71.8	68.2	79.0	66.6	60.3	62.3	69.9	67.3	68.4	73.8	68.9	67.8	68.3	66.6	67.8
BARLEY: per bush.															
July	41.9	42.3	47.5	26.3	....	40.6	38.0	35.0	40.8	49.5	43.7	40.0	37.5	42.1	41.2
August	40.0	45.8	47.5	39.0	....	41.5	39.5	35.0	41.9	47.5	43.8	40.0	37.5	41.8	41.9
September	37.9	41.1	47.5	34.8	....	44.1	37.8	35.0	42.8	47.5	42.7	40.0	37.5	41.0	41.2
October	37.5	38.8	47.5	31.3	....	42.8	39.2	34.4	40.8	45.0	37.7	40 0	37.5	43.2	41.0
November	45.0	42.6	47.5	33.6	42.2	42.7	37.7	34.0	38.0	47.5	40.0	40.0	37.9	44.9	41.8
December	43.9	43.1	47.5	34.1	40.5	42.5	37.8	32.4	38.2	48.5	38.0	40.0	37.6	41.1	40.7
Average	41.3	42.2	47.5	32.2	41.3	42.4	38.3	34.3	40.4	47.7	40.9	40.0	37.6	42.4	41.3
OATS: per bush.															
July	29.6	29.5	33.0	28.4	....	29.6	29.8	28.4	32.7	32.5	29.8	30.0	28.6	33.6	31.7
August	29.0	31.4	34.0	28.6	....	30.9	29.8	29.4	32.4	33.3	30.9	31.9	28.5	35.0	32.7
September	28.4	28.8	33.3	26.1	....	29.6	29.7	26.0	32.3	31.4	29 3	32.3	28.9	32.9	31.0
October	28.0	27.3	30.0	25.7	..	29.1	28.5	26.3	29.3	30.8	28.5	32.0	27.3	31.3	29.7
November	28.6	28.1	29.0	26.9	28.0	29.1	27.5	26.0	30.6	32.6	28.9	32.0	27.1	32.3	30.6
December	28.3	28.5	29.0	27.6	27.3	27.6	26.7	25.4	29.3	30.9	27.6	32.0	26.6	30 3	29.1
Average	28.7	28.9	31.3	27.1	27.7	29.2	28.5	26.9	31.1	31.9	29.1	31.8	27.8	32.6	30.8
RYE: per bush.															
July	82.5	56.0	57.5	....	....	75.0	70.0	...	56.0	....	78.0	....	....	.....	62.3
August	....	55.8	57.5	....	....	75.0	64.6	....	56.1	....	78.0	....	....	.....	60.7
September	52.5	54.8	57.5	....	....	66.8	56.3	50.0	56.0	....	61.6	...	....	61.5	57.8
October	....	52.0	57.5	....	...	54.5	53.7	50.0	54.1	....	52.0	....	....	57.3	54.9
November	47.5	50.5	57.5	....	48.0	54.5	49.3	50.0	53.9	....	49.8	....	....	55.0	53.3
December	47.5	48.0	57.5	....	45.7	54.5	46.8	46.0	56.0	....	45.2	....	....	50.2	51.3
Average	59.0	52.7	57.5	....	46.8	63.2	54.8	48.6	55.4	....	59.9	....	....	55.0	55.8
PEAS: per bush.															
July	61.3	56.4	57.5	53.8	....	56.8	60.2	58.4	54.9	58.0	59.8	50.0	58.0	61.4	58.6
August	61.5	59.0	57.5	51.3	....	56.4	61.8	58.0	55.2	60.0	61.3	....	58.0	61.0	59.0
September	59.2	57.9	57.5	51.3	....	57.3	61.2	56.6	58.4	61.1	60.1	....	59.2	61.4	59.6
October	55.0	56.9	57.5	50.6	....	57.4	59.9	55.0	58.5	66.0	59.4	....	57.6	60.4	59.2
November	59.0	57.4	57.5	50.0	56.0	57.7	60.2	54.0	58.8	63.7	61.1	....	57.3	61.3	60.1
December	57.7	54.1	57.5	58.3	53.7	53.6	56.9	51.6	57.4	69.7	55.2	....	53.4	56.3	57.6
Average	59.1	56.9	57.5	52.8	54.8	56.4	59.8	55.7	57.1	64.8	59.3	50.0	57.2	60.3	59.0

MARKET PRICES.—*Continued.*

TABLE VIII. Showing the average price of Agricultural Products.—*Continued.*

Province.	Belleville.	Brantford.	Brockville.	Chatham.	Cobourg.	Guelph.	Kingston.	Lindsay.	London.	Ottawa.	Peterborough.	St. Thomas.	Stratford.	Toronto.	The Province.
	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.
CORN (in ear): per bush.															
October	....	24.5	26.0	30 3	....	....	30.7	....	29.4	23.1	.....	25.0	..	.... .	26.6
November	....	24.8	26.0	31.0	....	....	31.3	....	28.8	32.5	.....	25.0	....	.....	26.8
December	....	23.2	26.0	28.8	....	....	29.2	....	27.8	33.8	.....	25.0	....	....	25.8
Average	....	24.1	26.0	29.9	....	....	30.2	....	28.6	33.3	.....	25.0	...	.....	26.3
BUCKWHEAT: per bush.															
October	....	38.4	42.5	....	....	....	39.9	38.3	38.3	58.0	40.9	....	..	....	45.1
November	42.5	41.0	42.5	....	40.0	....	39.5	40.0	37.6	52.4	39.4	....	....	.....	42.2
December	39.0	40.0	42.5	....	38.0	....	38.5	36.0	38.4	50.9	37.1	....	....	.....	40.6
Average	39.7	39.8	42.5	....	38.8	....	39.2	37.8	38.1	53.6	39.0	....	....	.....	42.2
BEANS: per bush.															
October	....	....	....	96.7	....	....	....	....	100.0	....	.....	....	...	.....	99.6
November	....	....	....	85.0	....	....	...	....	100.0	....	.....	. ..	....	.....	98.3
December	....	....	....	90.0	....	....	....	....	100.0	....	.....	....	....	.. ...	98.7
Average	....	...	....	90.5	....	....	....	....	100.0	....	.....	....	....	.....	98.8
POTATOES: per bush.															
October	36.6	49.2	61.3	43.3	....	38.1	52.7	30.0	60.6	56.9	34.1	56 8	49.6	36.6	45.9
November	41.6	54.1	55.0	....	....	48.4	58.8	32.5	62.9	57.8	41.3	62.2	51.6	44.0	51.0
December	42.6	55.8	55.0	48.8	....	49.2	63.0	36.5	65.0	61.0	46.0	68.0	57.0	47.2	53.8
Average	41.0	53.0	57.1	46.6	....	45.4	58.5	33.3	62.9	58.6	40.9	64.0	53.1	42.5	50.4
WOOL: per lb.															
July	18.3	17.0	25.0	17.0	....	18.5	16.5	16.0	16.8	19.0	16.0	16.5	....	21.7	18.2
August	19.0	17.0	25.0	17.5	....	18.0	16.3	16.0	17.0	16.9	16.0	....	....	21.7	18.0
September	18.6	16.7	25.0	17.5	....	18.6	16.3	16.0	17.0	17.7	16.0	....	....	21.7	18.3
October	18.0	16.9	25.0	18.0	....	18.3	16.4	....	17.0	16.6	16.0	....	....	21.9	18.3
November	17.5	17.7	25.0	....	...	18.6	16.4	....	17.0	19.0	16.0	....	....	22.0	18.5
December	17.5	17.4	25.0	...	....	18.6	16.2	....	17.0	16.8	16.0	....	....	21.8	18.1
Average	18.0	17.1	25.0	17.3	....	18.4	16.3	16.0	17.0	17.6	16.0	16.5	....	21.8	18.2
HAY: per ton.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
July	9 29	9 30	9 00	7 83	....	8 16	9 00	8 15	8 56	9 13	12 50	9 50	8 50	9 18	8 98
August	7 40	6 29	7 50	7 00	....	7 13	9 00	6 50	6 50	7 49	10 25	8 00	6 63	8 96	7 81
September	7 33	6 68	7 50	....	....	7 14	9 08	6 50	6 76	8 12	8 00	7 90	6 10	9 46	8 08
October	7 00	6 83	7 50	7 50	....	7 16	8 33	6 50	7 33	7 97	7 50	8 00	6 44	8 92	8 05
November	7 00	6 57	7 67	....	....	7 39	7 50	6 50	7 99	9 20	7 50	8 00	6 50	10 12	8 71
December	7 00	6 79	8 25	6 75	....	6 85	7 60	6 50	7 18	8 57	7 50	8 00	6 50	8 49	7 78
Average	7 51	6 98	7 95	7 38	....	7 28	8 17	6 83	7 38	8 39	8 79	8 17	6 74	9 19	8 20

VALUES—FALL AND SPRING WHEAT.

TABLE IX. Showing by County Municipalities and groups of Counties the value at market prices of the total crop of Fall and Spring Wheat in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Fall wheat.			Spring wheat.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$	$	$	$	$	$
Essex	455,839	905,393	568,776	8,168	32,218	21,446
Kent	949,116	1,558,755	1,067,884	35,106	70,861	48,196
Elgin	743,236	1,163,285	792,679	8,809	18,388	20,029
Norfolk	648,379	866,704	563,830	6,364	15,155	10,130
Haldimand	501,772	675,049	486,035	25,799	61,370	39,120
Welland	287,040	480,230	327,083	1,791	8,021	14,620
Totals	3,585,382	5,649,416	3,806,287	86,037	206,013	153,541
Lambton	595 497	1,023,104	623,100	41,054	110,718	77,771
Huron	979,775	1,445,319	1,148,052	195,417	241,184	198,002
Bruce	607,245	889,643	795,721	169,309	215,078	169,100
Totals	2,182,517	3,363,066	2,566,873	405,780	566,980	444,873
Grey	316,490	472,467	458,333	222,436	431,657	479,651
Simcoe	900,813	1,276,599	1,013,887	325,842	563,470	466,040
Totals	1,217,303	1,749,066	1,472,220	548,278	995,127	945,691
Middlesex	1,343,133	1,920,268	1,331,726	51,403	80,932	119,288
Oxford	731,646	1,050,607	722,052	45,425	117,288	117,766
Brant	546,307	708,934	501,839	11,239	16,204	14,504
Perth	652,821	1,020,001	774,873	132,024	226,391	161,094
Wellington	228,960	348,184	414,098	356,187	484,447	291,737
Waterloo	714,701	900,979	730,374	63,773	54,736	62,139
Dufferin	82,634	142,673	160,494	197,171	426,554	275,097
Totals	4,300,202	6,091,646	4,635,456	857,222	1,406,552	1,041,625
Lincoln	331,903	472,373	348,267	12,158	32,025	26,259
Wentworth	510,185	601,072	497,441	30,388	70,332	37,653
Halton	382,518	411,419	369,344	62,640	89,577	56,946
Peel	439,494	488,131	470,903	210,570	346,786	213,215
York	559,381	774,608	693,962	296,723	488,975	395,766
Ontario	127,642	135,890	172,578	357,239	1,034,150	703,811
Durham	71,603	105,044	71,707	203,503	611,057	510,347
Northumberland	247,322	242,281	213,784	201,661	380,925	332,703
Prince Edward	91,527	112,773	48,514	51,013	64,160	74,991
Totals	2,761,575	3,343,591	2,886,500	1,425,895	3,117,987	2,351,691
Lennox and Addington	40,698	79,153	39,010	45,386	48,562	71,134
Frontenac	14,015	21,413	26,253	94,864	164,513	116,972
Leeds and Grenville	35,563	17,946	74,701	136,054	191,464	177,590
Dundas	12,600	10,194	16,788	59,884	88,766	74,363
Stormont	2,419	2,330	8,891	55,012	74,909	69,292
Glengarry	3,123	3,246	7,479	94,113	152,618	113,746
Prescott	.....	.....	684	94,669	165,724	116,182
Russell	.....	1,071	2,981	38,612	85,417	59,838
Carleton	8,396	1,824	17,968	328,117	631,536	353,085
Renfrew	8,150	3,722	13,884	378,911	430,785	366,809
Lanark	21,810	32,719	49,200	210,213	282,736	197,940
Totals	146,774	203,618	257,339	1,535,835	2,317,030	1,716,951
Victoria	45,869	56,876	124,220	306,167	583,447	434,762
Peterborough	85,587	103,991	163,439	216,970	477,159	313,383
Haliburton	1,400	1,760	1,865	16,090	26,090	16,673
Hastings	148,917	224,441	165,492	128,877	128,252	187,957
Totals	281,773	387,068	455,016	668,104	1,214,948	952,775
Muskoka	362	411	899	11,647	14,615	17,404
Parry Sound	661	901	716	10,884	13,188	18,531
Nipissing	99	.....	32	4,186	4,783	1,124
Algoma	11,547	11,953	8,801	67,020	93,796	102,517
Totals	12,669	13,265	10,448	93,737	126,382	139,576
The Province	14,488,195	20,800,736	16,090,639	5,620,888	9,951,019	7,746,723

VALUES—BARLEY AND OATS.

TABLE X. Showing by County Municipalities and groups of Counties the valule at market prices of the total crop of Barley and Oats in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Barley.			Oats.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$	$	$	$	$	$
Essex	30,870	60,598	46,197	370,248	472,277	414,937
Kent	74,054	112,126	98,419	437,835	583,503	473,657
Elgin	53,354	82,336	70,216	295,272	498,890	430,985
Norfolk	25,903	61,701	79,287	245,731	354,476	304,650
Haldimand	59,378	64,147	154,872	207,133	228,884	259,471
Welland	24,680	39,830	45,494	145,764	260,046	215,264
Totals	268,239	420,738	494,485	1,701,983	2,398,076	2,098,964
Lambton	70,456	164,805	194,555	409,972	780,581	535,143
Huron	193,241	303,084	388,718	1,083,900	1,316,589	1,061,327
Bruce	122,890	182,756	251,085	810,848	991,484	746,477
Totals	386,587	650,645	834,358	2,304,720	3,088,654	2,342,947
Grey	148,621	177,689	280,545	1,174,558	1,396,385	1,061,527
Simcoe	335,634	403,336	426,312	885,156	1,077,438	818,179
Totals	484,255	581,025	706,857	2,059,714	2,473,823	1,879,706
Middlesex	108,611	205,584	212,786	792,499	1,195,830	996,999
Oxford	122,262	235,691	262,735	642,924	955,418	740,370
Brant	125,317	185,832	258,778	184,396	293,841	237,771
Perth	115,449	231,970	267,715	823,997	1,171,115	863,878
Wellington	284,598	449,580	518,735	877,860	1,379,873	982,706
Waterloo	187,107	276,216	275,772	543,652	676,524	505,662
Dufferin	101,247	154,992	159,635	466,557	560,071	390,180
Totals	1,044,591	1,739,865	1,956,156	4,331,885	6,232,672	4,717,566
Lincoln	24,417	32,704	54,758	201,404	214,532	210,313
Wentworth	96,268	130,886	185,126	281,121	382,360	366,889
Halton	73,757	110,487	182,882	250,128	308,803	252,030
Peel	236,938	371,734	495,532	403,646	591,536	415,458
York	436,707	699,130	842,996	916,497	1,319,353	948,906
Ontario	274,927	448,899	559,189	681,611	948,330	697,674
Durham	339,120	514,500	631,700	419,014	603,204	442,182
Northumberland	221,214	303,088	500,003	305,461	440,932	329,713
Prince Edward	177,050	265,435	411,908	121,659	191,461	138,447
Totals	1,880,398	2,876,863	3,864,094	3,580,541	5,000,511	3,801,612
Lennox and Addington	131,272	227,488	419,024	200,914	299,465	229,471
Frontenac	51,048	105,992	200,889	282,899	404,484	292,030
Leeds and Grenville	78,469	128,446	139,261	666,038	1,015,988	755,594
Dundas	37,807	76,455	99,336	361,167	487,943	380,892
Stormont	28,126	39,419	35,893	303,402	348,161	303,053
Glengarry	19,125	30,231	27,415	347,180	449,190	351,521
Prescott	38,201	57,254	43,622	302,628	379,528	299,218
Russell	16,660	35,551	21,327	181,936	313,461	217,528
Carleton	84,693	205,489	129,450	740,702	1,139,118	782,883
Renfrew	12,653	18,037	18,385	484,627	641,736	478,009
Lanark	35,975	43,136	40,734	472,591	654,627	436,146
Totals	534,029	967,498	1,175,336	4,344,084	6,133,701	4,526,345
Victoria	224,069	355,389	397,625	516,905	635,537	482,400
Peterborough	53,322	70,459	155,583	321,932	470,982	344,971
Haliburton	1,310	3,044	3,378	43,019	60,692	50,346
Hastings	163,158	229,832	437,066	411,761	561,348	447,129
Totals	441,859	658,724	993,652	1,293,617	1,728,559	1,324,846
Muskoka	5,573	7,670	6,354	102,940	122,381	95,991
Parry Sound	6,880	10,344	8,229	93,589	101,075	61,346
Nipissing	2,354	1,624	559	29,129	25,030	6,756
Algoma	14,528	10,679	9,029	103,278	74,001	63,958
Totals	29,335	30,317	24,171	328,936	322,487	228,051
The Province	5,069,293	7,925,675	10,049,109	19,945,480	27,378,483	20,920,037

VALUES—RYE AND PEAS.

TABLE XI. Showing by County Municipalities and groups of Counties the value at market prices of the total crop of Rye and Peas in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Rye.			Peas.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$	$	$	$	$	$
Essex	8,624	7,601	9,011	14,539	23,063	39,525
Kent	8,484	12,144	9,063	26,273	75,223	109,384
Elgin	17,727	8,512	13,494	100,716	233,574	145,347
Norfolk	44,654	58,913	59,510	205,044	287,527	194,830
Haldimand	9,699	3,394	7,756	126,531	160,326	152,042
Welland	3,350	5,246	5,747	42,412	56,050	44,589
Totals	92,538	95,810	104,581	515,515	835,763	685,717
Lambton	2,545	1,434	2,354	49,141	136,676	108,357
Huron	8,422	5,032	3,433	539,772	718,856	477,664
Bruce	2,452	7,950	4,897	572,917	802,701	552,247
Totals	13,419	14,416	10,684	1,161,830	1,658,233	1,138,268
Grey	4,068	6,702	5,756	523,104	831,214	618,402
Simcoe	9,078	24,756	23,659	550,030	634,366	451,194
Totals	13,146	31,458	29,415	1,073,134	1,465,580	1,069,596
Middlesex	6,171	5,898	5,295	144,363	403,240	263,844
Oxford	9,786	7,403	10,656	170,752	325,626	208,985
Brant	13,451	5,695	9,422	121,084	191,488	120,613
Perth	1,805	85	1,522	279,933	471,899	329,878
Wellington	13,353	8,177	9,012	440,777	598,036	519,804
Waterloo	6,211	4,935	5,444	266,222	319,689	217,630
Dufferin	2,574	4,555	6,810	190,208	227,141	163,342
Totals	53,351	36,748	48,161	1,613,339	2,537,119	1,824,096
Lincoln	3,596	1,049	3,679	73,973	60,488	56,716
Wentworth	3,962	9,206	9,267	121,217	170,184	137,088
Halton	7,107	8,359	5,644	124,289	162,048	139,977
Peel	13,043	5,290	14,357	251,838	236,109	191,420
York	9,839	10,742	15,581	410,768	508,930	401,938
Ontario	10,815	13,458	25,123	372,762	514,990	353,144
Durham	17,803	31,955	40,419	434,866	392,274	283,372
Northumberland	60,113	86,406	86,851	347,453	320,362	233,724
Prince Edward	42,135	61,824	68,458	238,914	302,678	164,557
Totals	168,413	228,289	269,379	2,376,080	2,668,063	1,961,936
Lennox and Addington	16,748	29,438	39,616	117,280	154,709	105,609
Frontenac	18,173	39,667	35,073	101,969	159,301	121,269
Leeds and Grenville	20,369	30,837	57,232	55,262	100,715	73,925
Dundas	10,810	10,007	16,621	11,546	26,787	21,875
Stormont	2,888	4,136	5,281	14,040	38,489	30,758
Glengarry	636	.....	616	21,419	62,546	59,549
Prescott	797	.....	2,318	23,083	105,988	82,337
Russell	2,962	8,188	3,354	16,653	42,263	42,481
Carleton	17,456	23,266	56,129	107,423	225,658	167,891
Renfrew	68,327	96,913	77,799	268,310	317,056	266,906
Lanark	17,948	37,227	47,204	132,690	204,512	152,128
Totals	177,114	279,679	341,243	869,675	1,438,024	1,124,782
Victoria	11,686	11,417	12,255	269,149	278,328	214,205
Peterborough	31,022	35,083	31,452	203,466	240,614	184,958
Haliburton	1,413	2,679	2,522	23,208	28,577	19,897
Hastings	58,077	73,403	115,168	236,725	303,717	213,171
Totals	102,198	122,582	161,397	732,548	851,236	632,231
Muskoka	1,895	1,711	3,864	41,720	66,783	38,938
Parry Sound	4,673	4,237	4,167	38,398	47,875	23,235
Nipissing	821	2,446	372	10,511	10,361	2,691
Algoma	4,369	2,961	2,420	118,964	111,330	70,030
Totals	11,758	11,355	10,823	209,593	236,349	134,894
The Province	631,937	820,337	975,683	8,551,714	11,690,367	8,571,520

VALUES—CORN AND BUCKWHEAT.

TABLE XII. Showing by County Municipalities and groups of Counties the value at market prices of the total crop of Corn (for husking and silo) and Buckwheat in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Corn.					Buckwheat.		
	Husking.	Silo.	Total.			1892.	1891.	1882-92.
			1892.	1891.	1882-92.			
	$	$	$	$	$	$	$	$
Essex	456,406	29,594	486,000	830,810	660,441	19,139	24,105	8,526
Kent	496,553	20,788	517,341	728,421	546,241	16,233	15,663	8,601
Elgin	218,001	28,872	246,873	378,425	297,681	25,639	22,625	12,680
Norfolk	211,797	36,418	248,215	278,611	253,717	42,644	48,223	36,042
Haldimand	17,975	7,656	25,631	27,443	34,484	3,761	5,736	4,904
Welland	76,281	15,730	92,011	148,420	110,427	14,285	39,589	14,955
Totals	1,477,013	139,058	1,616,071	2,392,130	1,902,991	121,701	155,941	85,508
Lambton	135,633	27,970	163,603	276,601	144,753	6,644	9,185	4,339
Huron	17,828	64,910	82,738	56,054	39,518	8,165	4,668	2,638
Bruce	6,974	47,992	54,966	32,278	16,082	8,502	6,848	3,309
Totals	160,435	140,872	301,307	364,933	200,353	23,311	20,701	10,286
Grey	8,534	51,884	60,418	19,493	14,509	8,923	5,847	3,196
Simcoe	19,151	73,620	92,771	33,918	22,609	21,392	7,092	4,581
Totals	27,685	125,504	153,189	53,411	37,118	30,315	12,939	7,777
Middlesex	166,696	75,642	242,338	346,866	225,403	8,237	4,530	3,968
Oxford	85,254	106,668	191,922	256,096	167,610	5,484	8,705	4,855
Brant	52,207	30,590	82,797	121,225	95,758	4,117	5,202	4,836
Perth	7,977	67,516	75,493	49,912	23,505	2,564	1,290	999
Wellington	6,075	53,394	59,469	25,992	17,355	2,289	3,490	1,836
Waterloo	13,363	28,504	41,867	41,589	28,238	4,501	1,681	1,122
Dufferin	4,326	2,430	6,756	3,981	2,025	793	3,076	930
Totals	335,898	364,744	700,642	845,661	559,894	27,985	27,974	18,546
Lincoln	113,368	14,006	127 374	159,304	116,473	8,878	10,497	6,499
Wentworth	54,440	94,024	148,464	136,436	103,298	9,690	7,690	6,505
Halton	12,230	22,386	34,616	53,893	25,796	3,589	1,087	1,199
Peel	3,966	38,516	42,482	27,617	14,539	2,038	3,826	1,901
York	11,266	45,448	56,714	64,374	34,177	4,306	5,961	2,493
Ontario	40,253	37,340	77,593	57,148	47,850	38,153	32,025	9,930
Durham	33,447	15,950	49,397	56,700	33,094	81,515	74,661	24,478
Northumberland	76,487	61,068	137,555	125,382	74,540	150,898	125,278	63,379
Prince Edward	94,118	30,392	124,510	136,708	94,015	126,981	101,138	68,003
Totals	439,575	359,130	798,705	817,562	543,782	426,048	362,163	184,387
Lennox & Add'ton	28,515	37,466	65,981	86,460	42,636	52,635	66,655	32,750
Frontenac	39,256	35,226	74,482	67,660	34,560	31,368	31,484	17,117
Leeds & Grenville	139,763	152,880	292,643	325,593	141,916	35,610	69,656	46,984
Dundas	38,332	54,470	92,802	117,958	44,253	14,001	32,919	17,430
Stormont	31,191	57,062	88,253	67,413	31,669	18,757	34,131	20,692
Glengarry	13,267	63,388	76,655	54,159	22,890	6,922	15,951	9,750
Prescott	38,287	18,988	57,275	69,119	28,264	10,875	18,943	12,400
Russell	6,670	43,874	50.544	33,695	12,745	5,798	19,117	9,081
Carleton	13,252	98,552	111,804	90,377	36,192	39,318	48,199	31,689
Renfrew	7,773	25,046	32,819	23,777	11,000	23,191	20,714	11 315
Lanark	18,909	53,582	72,491	44,490	27,024	46,807	55,356	45,786
Totals	375,215	640,534	1,015,749	980,701	433,149	285,282	413,125	254,994
Victoria	6,048	13,496	19,544	16,421	11,733	42,454	34,751	10,613
Peterborough	3,448	19,848	23,296	12,543	7,817	18,441	26,313	9,589
Haliburton	3,398	132	3,530	1,894	1,802	3,989	7,077	2,225
Hastings	119,911	91,496	211,407	194,689	105,723	73,223	74,889	39,861
Totals	132,805	124,972	257,777	225,547	127,075	138,107	143,030	62,288
Muskoka	2,563	1,056	3,619	3,309	2.479	3,822	7,362	3,483
Parry Sound	881	1,620	2,501	1,400	715	1,747	1,808	1,064
Nipissing	552	.....	552	1,110	188	494	1,743	289
Algoma	736	324	1,060	2,009	1,102	5,140	3,405	1,257
Totals	4,732	3,000	7,732	7,828	4,484	11,203	14,318	6,093
The Province	2,953,358	1,897,814	4,851,172	5,687,773	3,808,846	1,063,952	1,150,191	629,879

VALUES—BEANS AND POTATOES.

TABLE XIII. Showing by County Municipalities and groups of Counties the value at market prices of the total crop of Beans and Potatoes in Ontario, in the years 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Beans.			Potatoes.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$	$	$	$	$	$
Essex	9,431	29,938	12,873	97,194	83,943	124,801
Kent	328,645	483,688	289,091	106,800	145,743	185,363
Elgin	23,338	72,088	31,025	76,286	121,031	123,513
Norfolk	6,688	2,955	11,097	105,893	109,944	155,650
Haldimand	7,082	3,236	3,936	31,880	34,167	66,930
Welland	8,882	25,776	12,676	83,414	68,021	98,787
Totals	384,066	617,681	360,698	501,467	562,849	755,044
Lambton	6,943	14,939	7,510	65,444	136,264	131,694
Huron	1,522	3,528	2,868	237,535	272,786	283,570
Bruce	889	3,909	2,115	172,755	279,459	248,588
Totals	9,354	22,376	12,493	475,734	688,509	663,852
Grey	3,532	3,987	2,824	253,232	354,548	392,235
Simcoe	2,371	3,209	2,130	373,048	399,088	394,516
Totals	5,903	7,196	4,954	626,280	753,636	786,751
Middlesex	6,891	7,497	6,739	103,351	282,177	259,572
Oxford	5,987	2,748	6,195	99,068	176,486	159,958
Brant	445	1,566	7,137	72,704	115,169	109,471
Perth	217	477	1,231	147,966	187,503	191,431
Wellington	1,107	361	722	290,187	296,129	330,683
Waterloo	553	170	714	145,346	134,181	159,647
Dufferin	.....	2,206	545	159,395	194,278	201,268
Totals	15,200	15,025	23,283	1,018,017	1,385,923	1,412,030
Lincoln	1,668	3,992	3,470	55,934	72,386	80,714
Wentworth	830	4,348	3,530	143,288	200,678	191,650
Halton	198	186	635	50,022	62,438	77,578
Peel	869	509	1,294	135,746	138,632	139,555
York	1,932	3,384	3,257	288,843	341,987	354,567
Ontario	3,030	4,354	5,663	235,350	250,010	234,839
Durham	5,575	9,344	6,908	164,199	159,589	181,163
Northumberland	12,596	9,595	11,470	277,346	191,646	219,171
Prince Edward	8,278	4,272	9,391	68,069	87,628	98,441
Totals	34,976	39,984	45,618	1,418,797	1,504,994	1,577,678
Lennox and Addington	5,481	8,207	4,263	98,498	148,946	163,729
Frontenac	2,076	5,967	7,271	135,170	206,160	184,612
Leeds and Grenville	6,919	12,561	8,946	194,546	379,707	377,057
Dundas	3,507	7,631	6,467	53,590	142,178	150,502
Stormont	1,671	7,703	4,760	41,021	86,165	110,795
Glengarry	3,952	3,695	3,079	55,454	112,053	123,165
Prescott	5,482	19,514	14,726	68,258	150,779	135,437
Russell	2,248	4,346	4,343	40,549	80,372	70,519
Carleton	12,040	9,459	10,887	183,548	340,557	354,148
Renfrew	11,788	14,448	11,812	215,290	255,818	265,639
Lanark	2,666	6,455	5,910	194,413	199,814	229,519
Totals	57,830	99,986	82,464	1,280,337	2,102,549	2,165,122
Victoria	5,761	2,831	2,345	145,364	156,610	184,793
Peterborough	2,066	2,491	2,485	139,441	139,006	149,013
Haliburton	640	993	563	44,171	36,460	42,671
Hastings	10,962	4,631	6,900	236,085	251,643	311,149
Totals	19,429	10,946	12,293	565,061	583,719	687,626
Muskoka	548	870	856	79,068	79,018	85,202
Parry Sound	384	721	404	87,237	75,448	60,171
Nipissing	332	1,665	208	47,386	32,615	9,703
Algoma	1,478	96	399	94,684	72,959	65,522
Totals	2,742	3,352	1,867	308,375	260,040	220,598
The Province	529,500	816,546	543,670	6,194,068	7,842,219	8,268,701

VALUES—MANGEL-WURZELS AND CARROTS.

TABLE XIV. Showing by County Municipalities and groups of Counties the value at market prices of the total crop of Mangel-wurzels and Carrots in Ontario, in the years 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Mangel-wurzels.			Carrots.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$	$	$	$	$	$
Essex	16,096	7,294	7,327	3,038	3,557	2,879
Kent	9,797	18,390	10,503	5,310	8,659	5,731
Elgin	13,401	22,420	10,574	8,883	13,126	6,860
Norfolk	6,168	11,890	7,003	8,730	7,084	5,715
Haldimand	5,099	4,015	4,652	4,210	2,537	2,974
Welland	3,935	7,461	5,045	3,358	3,251	2,891
Totals	54,496	71,470	45,104	33,529	38,214	27,050
Lambton	12,424	26,550	13,550	7,472	10,310	7,581
Huron	79,176	82,310	60,358	14,016	25,260	23,401
Bruce	19,663	16,593	15,487	20,206	12,206	13,092
Totals	111,263	125,453	89,395	41,694	47,776	44,074
Grey	14,303	12,957	13,378	26,154	18,974	24,407
Simcoe	17,326	18,817	19,830	20,782	24,064	25,769
Totals	31,629	31,774	33,208	46,936	43,038	50,176
Middlesex	35,975	99,402	50,136	13,366	34,341	20,012
Oxford	46,426	80,481	49,299	11,778	18,937	17,150
Brant	11,564	20,563	14,364	4,450	8,330	10,271
Perth	68,337	82,377	65,602	10,935	15,323	19,094
Wellington	56,452	53,273	37,102	19,406	14,024	13,313
Waterloo	22,750	26,710	17,948	16,498	17,040	16,934
Dufferin	3,936	6,384	4,208	7,852	1,408	6,012
Totals	245,440	369,190	238,659	84,285	109,403	102,786
Lincoln	9,654	9,999	7,871	7,909	3,460	4,808
Wentworth	19,168	17,700	17,606	6,826	16,480	10,655
Halton	16,316	21,419	16,499	4,918	3,142	5,802
Peel	25,950	13,446	15,149	12,054	7,007	12,524
York	68,679	59,836	63,753	19,840	20,345	34,099
Ontario	25,657	29,080	28,120	15,175	13,584	22,938
Durham	37,267	18,226	18,346	22,372	13,115	22,539
Northumberland	24,207	18,938	16,710	17,440	9,996	12,093
Prince Edward	4,228	3,288	3,008	2,064	2,700	1,744
Totals	231,126	191,932	187,062	108,598	89,829	127,202
Lennox and Addington	2,437	3,622	3,452	1,420	2,579	2,073
Frontenac	4,828	6,794	5,155	6,460	12,341	5,840
Leeds and Grenville	11,767	10,842	8,121	14,075	13,201	7,983
Dundas	5,990	8,249	3,895	18,047	14,034	4,743
Stormont	650	2,232	1,037	2,123	2,386	1,589
Glengarry	3,337	5,754	2,201	4,379	4,744	1,872
Prescott	3,427	1,929	2,575	4,734	1,901	2,001
Russell	5,902	5,260	2,720	7,992	10,850	6,123
Carleton	11,592	27,646	17,359	14,352	24,661	22,726
Renfrew	7,082	3,615	3,347	10,714	5,999	4,736
Lanark	7,208	5,551	4,820	12,295	8,505	6,673
Totals	64,220	81,494	54,682	96,591	101,201	66,359
Victoria	51,850	28,757	23,953	11,968	11,250	13,384
Peterborough	13,371	9,490	9,348	33,735	15,397	15,516
Haliburton	208	185	187	352	1,602	791
Hastings	21,835	30,307	12,801	6,401	7,993	6,132
Totals	87,264	68,739	46,289	52,456	36,242	35,823
Muskoka	1,240	1,369	1,087	7,294	5,074	3,204
Parry Sound	704	504	247	3,887	3,713	1,419
Nipissing	96	93	19	600	120	88
Algoma	560	338	477	2,550	2,142	1,147
Totals	2,600	2,304	1,830	14,331	11,049	5,858
The Province	828,038	942,356	696,229	478,420	476,752	459,328

VALUES—TURNIPS AND HAY AND CLOVER.

TABLE XV. Showing by County Municipalities and groups of Counties the value at market prices of the total crops of Turnips and Hay and Clover in Ontario in the years 1891 and 1892, and the yearly average for the eleven years 1882-92.

Counties.	Turnips.			Hay and Clover.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$	$	$	$	$	$
Essex	10,522	5,290	6,042	407,983	639,186	594,829
Kent	12,662	17,604	12,352	730,317	741,433	818,487
Elgin	13,434	22,523	13,084	831,931	688,124	788,778
Norfolk	57,852	64,423	41,022	561,413	562,283	560,396
Haldimand	4,264	5,215	3,635	748,398	380,287	644,813
Welland	7,326	5,448	5,808	693,867	541,786	651,209
Totals	106,060	120,503	81,943	3,973,909	3,553,099	4,058,512
Lambton	18,148	22,972	11,485	1,019,227	930,052	851,229
Huron	380,907	430,466	282,974	1,735,194	1,196,800	1,428,589
Bruce	463,330	375,522	254,118	1,444,496	800,745	1,149,400
Totals	862,385	828,960	548,577	4,198,917	2,927,597	3,429,218
Grey	489,042	590,576	387,909	1,920,022	1,403,951	1,540,072
Simcoe	272,182	267,961	159,228	1,191,861	1,082,964	1,075,804
Totals	761,224	858,537	547,137	3,111,883	2,486,915	2,615,876
Middlesex	90,406	90,429	65,829	1,487,701	1,401,878	1,437,845
Oxford	329,816	412,608	246,583	1,089,846	1,057,918	1,015,124
Brant	159,073	227,505	132,302	527,096	441,123	475,094
Perth	266,041	320,153	195,631	1,182,383	892,762	1,082,514
Wellington	698,408	814,814	574,555	1,435,533	1,186,188	1,310,137
Waterloo	301,297	282,515	213,373	722,625	430,653	670,307
Dufferin	164,708	171,837	103,074	500,421	523,528	469,302
Totals	2,009,749	2,319,861	1,531,347	6,945,605	5,934,050	6,460,323
Lincoln	10,857	11,238	8,499	618,510	439,681	563,331
Wentworth	155,771	170,056	122,162	854,850	511,332	679,510
Halton	82,322	116,804	78,559	538,453	317,914	459,040
Peel	82,668	100,333	56,234	622,593	514,941	552,613
York	227,906	258,714	149,167	1,301,955	1,118,027	1,061,699
Ontario	754,303	791,248	524,143	757,951	723,818	769,577
Durham	333,960	344,472	237,549	525,013	551,099	613,878
Northumberland	235,934	199,230	139,099	690,600	518,669	685,410
Prince Edward	2,760	4,826	2,794	495,330	421,412	412,497
Totals	1,886,481	1,996,921	1,318,206	6,406,275	5,116,893	5,797,555
Lennox and Addington	5,644	5,861	3,975	885,108	741,517	635,022
Frontenac	13,252	23,075	11,666	915,169	809,201	777,059
Leeds and Grenville	17,662	21,468	11,883	1,700,024	972,416	1,473,853
Dundas	3,465	2,952	2,109	597,796	440,062	563,787
Stormont	517	2,590	2,224	393,256	405,440	506,736
Glengarry	13,062	3,520	2,576	545,103	306,147	592,795
Prescott	7,576	9,072	4,735	556,370	612,603	509,837
Russell	27,709	25,792	14,762	305,024	260,424	253,884
Carleton	64,654	94,663	58,238	812,440	805,902	821,148
Renfrew	27,973	40,079	21,855	661,158	572,311	679,259
Lanark	29,218	32,834	19,186	998,407	586,901	827,415
Totals	210,732	261,906	152,409	8,369,855	6,512,924	7,640,795
Victoria	242,266	193,447	138,957	503,037	431,321	461,255
Peterborough	118,317	112,811	55,087	490,942	360,087	441,524
Haliburton	9,265	12,140	9,002	129,781	73,520	109,086
Hastings	49,640	49,462	27,959	932,078	618,963	865,294
Totals	419,488	367,860	231,005	2,055,838	1,483,891	1,878,159
Muskoka	31,147	41,850	31,099	280,505	140,276	257,211
Parry Sound	29,134	50,793	22,609	240,014	187,582	130,657
Nipissing	7,117	9,180	1,787	64,444	36,004	15,075
Algoma	30,647	28,974	18,921	308,427	118,993	154,812
Totals	98,045	130,797	74,416	893,390	482,855	557,755
The Province	6,354,164	6,885,345	4,485,040	35,955,672	28,498,224	32,438,193

VALUES—ALL FIELD CROPS AND WOOL.

TABLE XVI. Showing by County Municipalities and groups of Counties the aggregate value of all Field Crops in Ontario in the years 1891 and 1892, and the yearly average for the eleven years 1882-92; also the value at market price of the total clip of Wool in 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	All field crops.			Wool.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$	$	$	$	$	$
Essex	1,937,691	3,125,273	2,517,410	14,593	17,223	15,568
Kent	3,257,973	4,572,213	3,682,972	21,011	24,661	22,168
Elgin	2,458,899	3,345,347	2,756,945	29,546	29,851	25,344
Norfolk	2,213,678	2,729,889	2,282,879	18,352	17,656	16,773
Haldimand	1,760,637	1,655,806	1,865,624	17,542	18,498	19,591
Welland	1,412,115	1,689,175	1,554,595	11,246	11,974	13,250
Totals	13,040,993	17,117,703	14,660,425	112,290	119,863	112,694
Lambton	2,468,570	3,649,191	2,713,421	32,110	31,720	28,390
Huron	5,559,780	6,101,936	5,401,112	61,755	57,448	52,969
Bruce	4,470,468	4,617,172	4,221,718	59,736	60,435	53,459
Totals	12,478,818	14,368,299	12,336,251	153,601	149,603	134,818
Grey	5,164,903	5,726,447	5,282,744	82,270	82,917	74,344
Simcoe	4,998,286	5,817,078	4,903,738	49,832	49,628	47,478
Totals	10,163,189	11,543,525	10,186,482	132,102	132,545	121,822
Middlesex	4,434,445	6,078,872	4,999,442	44,547	49,970	42,718
Oxford	3,503,122	4,706,012	3,729,338	16,262	17,033	20,141
Brant	1,864,040	2,342,677	1,992,160	11,045	13,142	14,457
Perth	3,759,965	4,671,258	3,978,967	30,660	35,438	34,041
Wellington	4,764,586	5,662,568	5,021,795	49,806	53,165	51,010
Waterloo	3,037,103	3,167,618	2,905,304	19,072	23,798	22,453
Dufferin	1,884,252	2,422,684	1,942,922	22,252	19,995	19,421
Totals	23,247,513	29,051,689	24,569,928	193,644	212,541	204,241
Lincoln	1,488,235	1,523,728	1,491,657	11,327	11,100	10,179
Wentworth	2,382,028	2,428,760	2,368,380	14,432	17,570	15,967
Halton	1,630,873	1,667,576	1,671,931	12,711	13,015	13,494
Peel	2,479,929	2,845,897	2,594,694	19,522	18,693	18,876
York	4,600,090	5,674,366	5,002,361	30,253	27,634	30,497
Ontario	3,732,208	4,996,984	4,154,579	28,134	34,639	31,130
Durham	2,705,207	3,485,240	3,117,682	22,019	30,612	23,465
Northumberland	2,929,820	2,972,728	2,918,650	18,943	21,383	21,879
Prince Edward	1,555,518	1,760,303	1,596,768	6,932	7,739	8,977
Totals	23,503,908	27,355,582	24,916,702	164,273	182,385	174,464
Lennox and Addington	1,669,502	1,902,662	1,791,764	12,187	10,741	14,159
Frontenac	1,745,773	2,058,052	1,835,766	14,198	16,568	17,151
Leeds and Grenville	3,265,001	3,320,840	3,354,246	24,402	24,745	32,011
Dundas	1,283,012	1,466,135	1,403,061	5,579	7,199	9,477
Stormont	952,135	1,115,504	1,132,670	8,028	6,637	9,233
Glengarry	1,194,460	1,203,854	1,318,654	10,177	13,610	13,272
Prescott	1,173,375	1,592,354	1,254,336	9,676	8,912	9,970
Russell	702,589	925,867	721,686	8,370	8,316	7,368
Carleton	2,536,535	3,668,355	2,859,793	21,417	20,084	26,257
Renfrew	2,210,993	2,445,010	2,230,809	32,239	36,727	32,495
Lanark	2,254,732	2,194,863	2,089,685	33,209	32,418	30,637
Totals	18,988,107	21,893,436	19,992,470	179,482	185,957	202,030
Victoria	2,396,089	2,796,382	2,512,500	26,197	24,197	23,203
Peterborough	1,751,908	2,076,426	1,884,165	15,678	16,076	16,519
Haliburton	278,376	256,713	261,008	3,465	4,014	3,164
Hastings	2,689,146	2,753,570	2,942,802	22,729	16,740	22,898
Totals	7,115,519	7,883,091	7,600,475	68,069	61,027	65,784
Muskoka	571,380	492,699	548,071	6,736	7,690	6,207
Parry Sound	520,693	499,589	333,510	6,692	5,749	3,190
Nipissing	168,121	126,774	38,891	516	623	144
Algoma	764,252	533,636	500,392	9,749	8,656	4,948
Totals	2,024,446	1,652,698	1,420,864	23,693	22,718	14,489
The Province	110,562,493	130,866,023	115,683,597	1,027,154	1,066,639	1,030,342

VALUE PER ACRE—FALL WHEAT, SPRING WHEAT AND BARLEY.

TABLE XVII. Showing by County Municipalities and groups of Counties the market value of crop per acre of Wheat and Barley in Ontario, in 1891 and 1892, with the yearly average for eleven years 1882-92.

Counties.	Fall Wheat.			Spring Wheat.			Barley.		
	1892	1891	1882-92	1892	1891	1882-92	1892	1891	1882-92
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	10 32	23 87	17 27	5 97	16 81	12 87	9 46	13 21	13 45
Kent	13 15	25 01	17 59	7 73	17 37	13 14	10 70	14 58	14 39
Elgin	14 71	27 29	18 01	9 63	18 12	12 83	9 38	15 27	14 22
Norfolk	15 98	25 49	16 80	7 12	15 61	12 02	9 00	12 42	13 76
Haldimand	12 44	20 92	14 56	5 97	12 73	11 14	8 01	8 00	11 89
Welland	11 59	21 68	14 56	6 44	13 19	11 68	8 47	12 77	12 44
Group	13 16	24 43	16 77	6 98	15 36	12 28	9 22	12 46	13 13
Lambton	13 08	25 30	17 30	6 31	18 58	12 35	7 02	14 48	13 77
Huron	15 84	26 15	17 97	10 10	20 72	12 14	11 27	14 09	14 76
Bruce	15 20	24 63	17 62	8 95	18 21	12 25	11 56	14 34	14 14
Group	14 81	25 47	17 70	9 06	19 28	12 22	10 23	14 26	14 33
Grey	15 20	23 30	17 97	8 68	17 28	12 73	10 66	13 85	13 46
Simcoe	15 84	23 78	18 80	8 07	19 04	13 33	10 82	14 78	13 78
Group	15 67	23 64	18 53	8 31	18 24	13 02	10 77	14 48	13 65
Middlesex	16 12	27 77	18 40	8 14	19 14	12 51	9 38	14 98	14 29
Oxford	16 69	27 39	18 57	7 59	20 07	13 70	10 82	16 45	16 16
Brant	16 90	26 34	17 34	8 07	17 65	12 06	8 96	12 82	14 25
Perth	15 98	28 24	18 11	8 95	21 55	13 17	11 61	16 40	16 04
Wellington	16 47	25 20	18 08	9 97	20 81	13 41	11 19	15 52	15 16
Waterloo	18 10	24 54	18 80	9 76	20 62	13 00	13 17	15 46	16 35
Dufferin	16 97	21 68	17 47	7 32	19 97	12 87	10 33	13 94	13 60
Group	16 63	26 76	18 25	8 78	20 45	13 10	10 85	15 18	15 18
Lincoln	13 65	22 25	16 17	5 56	13 66	11 94	10 04	10 56	13 20
Wentworth	15 91	25 11	16 77	7 32	16 16	12 55	10 24	11 98	14 54
Halton	16 12	21 97	17 27	7 66	16 54	12 74	10 66	12 57	14 96
Peel	16 83	20 92	18 64	8 88	19 69	14 59	11 32	13 55	14 73
York	15 48	23 87	19 60	9 09	20 35	14 80	11 15	15 96	15 50
Ontario	15 77	24 44	20 07	6 92	21 00	14 79	10 24	15 32	15 13
Durham	14 00	22 63	18 44	5 76	19 32	14 18	10 61	15 22	14 30
Northumberland	14 42	17 31	17 71	6 71	16 44	12 14	9 00	12 62	12 12
Prince Edward	13 86	17 12	16 04	6 71	17 00	11 74	8 14	11 78	11 15
Group	15 40	22 22	17 95	7 29	19 30	13 96	10 22	14 12	13 98
Lennox and Addington	14 49	16 36	15 93	8 27	17 09	12 61	7 85	12 67	11 99
Frontenac	15 20	17 21	16 92	10 24	19 42	13 37	9 50	12 91	12 61
Leeds and Grenville	14 92	15 98	16 68	10 17	20 72	13 85	9 25	14 44	13 44
Dundas	18 81	20 07	17 75	10 78	25 36	16 26	9 42	15 71	15 99
Stormont	16 68	23 78	17 03	10 78	22 11	15 62	10 24	15 76	14 70
Glengarry	16 61	16 65	15 61	11 12	19 97	14 35	9 17	13 94	12 34
Prescott	.....	.....	11 79	10 24	19 88	13 96	8 34	14 63	13 45
Russell	.....	25 50	17 03	10 03	24 43	15 06	8 84	16 01	13 05
Carleton	17 68	26 43	14 81	12 20	28 06	15 81	11 36	19 59	15 77
Renfrew	16 33	15 97	17 36	12 95	19 42	14 86	9 17	12 57	12 61
Lanark	17 04	16 64	17 43	11 87	20 07	13 41	9 83	15 22	13 65
Group	15 66	16 70	16 64	11 44	21 92	14 52	9 15	14 77	13 11
Victoria	15 55	21 11	17 70	6 92	19 23	13 17	9 95	15 56	13 61
Peterborough	13 50	16 74	17 25	6 92	15 61	11 78	9 46	12 42	13 08
Haliburton	13 08	19 78	14 69	8 68	15 79	11 61	7 84	12 03	12 60
Hastings	12 94	17 59	17 15	9 02	16 35	13 27	9 29	12 37	12 43
Group	13 48	17 79	17 32	7 28	17 26	12 67	9 63	13 92	12 98
Muskoka	11 31	15 22	15 50	9 49	17 09	13 27	8 05	12 08	11 39
Parry Sound	12 02	15 02	14 32	8 61	14 49	13 93	9 21	11 34	11 91
Nipissing	14 14	.....	16 00	12 20	16 72	13 88	10 32	12 03	10 96
Algoma	18 81	23 30	19 05	10 78	19 88	17 35	11 98	13 80	13 76
Group	17 89	22 11	18 27	10 36	18 67	16 17	10 19	12 34	12 36
The Province	14 99	24 47	17 71	8 63	19 49	13 55	10 15	14 33	13 94

VALUE PER ACRE—OATS, RYE AND PEAS.

TABLE XVIII. Showing by County Municipalities and groups of Counties the market value of crop per acre of Oats, Rye and Peas in Ontario, in 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Oats.			Rye.			Peas.		
	1892	1891	1882-92	1892	1891	1882-92	1892	1891	1882-92
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	9 18	13 94	13 07	8 93	15 11	11 38	10 92	11 80	11 40
Kent	11 58	15 84	14 06	9 37	15 98	12 00	8 38	12 19	11 35
Elgin	9 39	15 55	13 26	7 70	13 95	10 08	7 43	15 76	10 99
Norfolk	9 33	13 87	11 41	8 09	11 78	8 17	9 68	14 04	11 65
Haldimand	8 56	9 53	11 17	8 54	9 61	9 73	8 08	9 19	10 65
Welland	7 64	13 07	10 91	8 48	13 52	9 98	9 38	11 10	10 24
Group	9 50	13 92	12 52	8 24	12 59	9 06	8 68	12 68	11 12
Lambton	8 75	15 84	12 66	7 98	11 56	9 65	7 20	13 72	11 08
Huron	12 26	15 18	13 22	10 77	14 46	10 60	12 68	17 35	13 78
Bruce	11 52	13 47	11 82	7 09	13 52	10 62	12 63	17 10	14 09
Group	11 21	14 74	12 62	9 27	13 60	10 38	12 26	16 86	13 61
Grey	11 27	13 29	11 57	10 04	13 01	10 41	10 03	15 89	13 13
Simcoe	11 15	14 78	12 27	9 21	13 52	10 76	12 80	16 33	13 41
Group	11 22	13 89	11 86	9 45	13 41	10 69	11 28	16 08	13 24
Middlesex	10 50	15 88	13 51	11 16	14 89	10 36	7 26	16 33	11 65
Oxford	11 70	17 12	13 31	8 76	14 46	9 18	8 85	16 65	12 67
Brant	9 70	14 67	12 87	8 04	12 80	8 64	9 74	15 12	12 32
Perth	12 26	17 48	14 67	6 86	12 14	8 46	10 15	18 25	13 68
Wellington	12 04	15 77	13 33	9 88	12 80	10 55	11 15	15 89	13 71
Waterloo	12 23	15 95	13 56	11 72	15 33	10 59	14 22	17 10	14 04
Dufferin	11 92	14 27	12 33	13 00	14 46	10 84	10 86	14 16	12 72
Group	11 61	16 09	13 58	9 38	13 94	9 75	10 41	16 53	13 09
Lincoln	10 93	11 35	11 70	11 27	13 45	9 43	12 09	9 44	10 90
Wentworth	10 78	13 69	12 87	9 15	13 30	10 25	10 68	13 46	12 32
Halton	11 33	14 09	12 87	8 59	14 82	10 10	10 91	14 29	13 00
Peel	12 54	16 50	13 59	8 65	11 28	11 72	13 16	13 91	12 80
York	12 66	17 81	14 51	8 82	14 17	10 13	11 21	15 89	13 52
Ontario	11 92	16 46	13 74	8 87	11 86	10 56	11 80	16 65	12 85
Durham	10 72	15 04	12 69	7 59	11 86	9 13	13 16	15 12	12 35
Northumberland	8 96	13 58	10 68	7 03	9 11	7 90	12 39	14 10	11 07
Prince Edward	8 04	12 85	10 01	8 37	11 50	8 31	11 27	14 80	11 11
Group	11 31	15 44	13 00	7 89	10 74	8 79	11 97	14 87	12 41
Lennox and Addington	8 10	13 61	10 16	8 09	10 48	8 83	9 62	14 16	11 33
Frontenac	8 53	13 36	10 28	7 76	11 28	9 87	9 85	14 99	11 22
Leeds and Grenville	8 75	14 27	11 24	9 65	14 53	10 81	8 91	16 21	11 80
Dundas	10 72	16 13	12 70	12 56	17 14	13 70	8 50	17 23	13 40
Stormont	10 84	15 07	12 42	11 88	14 46	12 57	6 25	17 10	12 47
Glengarry	10 32	14 16	11 48	8 37	.....	9 78	4 90	14 16	10 93
Prescott	9 36	13 76	11 05	11 72	.....	10 88	4 07	17 48	10 16
Russell	9 24	15 70	11 61	10 77	18 08	13 05	5 49	15 50	11 86
Carleton	10 81	17 56	12 75	9 21	16 12	10 84	9 56	18 25	13 34
Renfrew	10 81	13 83	11 47	10 16	13 16	11 40	11 92	14 61	12 77
Lanark	10 41	15 40	11 37	10 43	13 74	11 49	10 09	17 35	13 15
Group	9 87	14 97	11 59	9 63	13 14	10 80	9 42	15 87	12 14
Victoria	11 33	14 56	12 09	10 10	13 45	10 30	12 04	15 76	12 80
Peterborough	9 70	12 85	11 19	8 59	10 63	9 09	11 68	15 12	12 03
Haliburton	8 01	11 72	9 77	8 31	12 94	10 01	10 15	12 44	11 56
Hastings	8 90	12 37	10 48	7 59	11 28	9 20	10 80	14 61	11 20
Group	9 92	13 21	11 18	8 12	11 28	9 27	11 45	15 02	11 96
Muskoka	9 21	11 90	10 40	8 20	14 03	11 10	9 91	15 95	12 74
Parry Sound	9 27	10 73	10 56	13 95	14 46	13 02	11 98	14 23	13 00
Nipissing	11 30	12 05	11 75	8 38	13 66	11 27	12 80	14 29	13 19
Algoma	11 73	10 26	12 35	13 28	14 17	10 61	16 05	16 21	15 77
Group	10 07	11 12	10 97	11 84	14 14	11 65	13 39	15 60	14 22
The Province	10 71	14 87	12 44	8 65	12 09	9 67	11 04	15 54	12 63

VALUE PER ACRE—CORN, BUCKWHEAT AND BEANS.

TABLE XIX. Showing by County Municipalities and groups of Counties the market value of crop per acre of Corn, (for Husking and Silo and the average for the two) Buckwheat and Beans in Ontario in 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Corn.					Buckwheat.			Beans.		
	Husking.	Silo.	Average.								
			1892.	1891.	1882-92.	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	14 73	15 20	14 76	22 49	20 76	8 82	10 54	8 81	15 51	20 69	22 12
Kent	17 57	16 24	17 51	24 04	20 46	7 72	12 04	8 25	15 02	18 46	19 17
Elgin	16 15	15 30	16 04	25 88	20 39	9 03	10 80	8 20	16 60	21 54	21 70
Norfolk	17 70	20 68	18 08	22 70	18 16	7 72	10 72	7 47	18 48	22 39	17 93
Haldimand	13 60	12 00	13 08	23 76	17 26	6 75	8 60	6 83	15 81	21 43	19 58
Welland	15 89	17 06	16 07	25 88	17 55	7 05	12 52	7 85	13 44	18 04	15 29
Group	16 26	16 49	16 28	23 68	19 95	8 00	11 13	7 79	15 14	18 89	19 24
Lambton	15 23	14 22	15 05	26 12	17 73	5 65	11 20	7 60	12 65	19 73	18 18
Huron	14 52	23 82	20 93	19 53	18 74	11 65	12 35	8 12	17 30	26 53	24 94
Bruce	14 81	27 44	24 76	17 35	16 82	11 52	10 72	7 52	19 76	29 17	19 58
Group	15 13	21 87	17 68	23 82	17 84	8 92	11 27	7 70	13 72	21 85	19 64
Grey	13 15	21 80	19 95	12 44	15 11	10 13	8 51	7 28	24 70	23 87	20 61
Simcoe	18 02	30 00	26 38	21 77	19 24	9 71	8 25	7 80	19 76	22 92	18 85
Group	16 17	25 96	23 40	17 09	17 39	9 83	8 36	7 58	22 44	23 44	19 82
Middlesex	16 81	17 84	17 12	27 24	19 37	8 23	11 16	7 11	18 47	21 86	19 88
Oxford	16 83	19 38	18 16	24 79	17 97	7 55	10 10	7 11	19 07	18 57	25 08
Brant	16 15	22 88	18 12	25 88	19 61	7 93	9 97	7 38	14 83	19 10	17 28
Perth	23 67	21 42	21 64	22 39	19 05	9 50	11 03	8 33	19 73	23 85	26 76
Wellington	15 78	24 80	23 43	19 28	18 52	9 50	8 51	8 78	19 77	21 24	18 05
Waterloo	20 28	22 20	21 55	23 17	19 11	6 33	9 09	6 93	19 75	21 25	18 31
Dufferin	13 15	27 00	16 12	15 55	13 97	8 44	11 03	8 38	.....	22 28	21 80
Group	16 86	20 54	18 59	25 34	18 89	7 86	10 06	7 42	18 72	20 96	20 26
Lincoln	18 59	15 34	18 17	25 44	18 06	7 30	11 42	8 21	13 24	20 79	20 90
Wentworth	19 02	21 58	20 56	25 56	20 81	9 75	12 30	8 26	19 76	22 07	21 93
Halton	15 78	14 00	14 58	26 75	18 10	9 49	9 88	6 52	19 80	26 57	18 14
Peel	10 52	19 20	17 83	23 33	18 04	5 91	11 03	6 86	19 75	21 21	25 37
York	15 12	16 66	16 33	21 77	18 17	9 83	10 49	8 20	18 58	25 25	24 31
Ontario	17 46	20 36	18 75	20 22	16 84	10 21	10 85	9 78	21 04	18 14	21 37
Durham	18 36	16 86	17 85	22 17	15 71	9 50	10 32	9 28	18 77	26 10	19 91
Northumberland	15 89	19 84	17 43	20 59	15 85	8 82	10 50	8 56	16 01	21 86	20 97
Prince Edward	14 07	17 18	14 72	19 47	13 99	8 02	10 01	8 78	20 75	17 30	22 36
Group	16 60	18 68	17 47	22 55	17 05	8 76	10 41	8 72	17 91	21 75	21 46
Lennox and Addington	15 83	22 00	18 83	23 64	16 28	7 55	10 54	9 09	19 16	25 89	23 30
Frontenac	18 02	18 00	18 01	21 46	16 24	9 66	11 11	9 27	15 61	20 16	27 03
Leeds and Grenville	16 38	19 48	17 87	27 12	19 32	6 88	10 94	8 35	16 20	24 30	22 82
Dundas	15 33	22 26	18 76	26 34	19 64	9 83	11 51	10 45	17 19	26 31	26 18
Stormont	15 02	27 46	21 24	23 48	18 73	6 75	12 30	9 35	15 62	31 83	28 50
Glengarry	17 25	22 90	21 67	22 55	18 07	6 08	11 07	8 38	19 76	18 57	23 68
Prescott	16 15	24 82	18 26	27 80	17 74	6 67	10 05	7 64	15 71	24 83	28 93
Russell	16 23	30 66	27 44	24 10	18 90	8 44	12 74	9 17	17 29	22 17	21 93
Carleton	12 99	23 88	21 72	22 30	17 23	9 28	11 86	8 46	22 13	25 36	24 14
Renfrew	15 12	23 54	20 80	18 32	16 22	10 89	10 94	8 71	22 03	21 86	23 91
Lanark	13 62	23 74	19 89	16 08	15 39	7 60	11 55	8 20	18 77	24 09	27 36
Group	15 96	22 52	19 53	24 17	17 97	8 02	11 25	8 68	18 92	24 12	25 33
Victoria	13 81	28 00	21 24	15 55	18 00	9 16	8 07	8 30	23 51	24 62	21 32
Peterborough	14 99	18 92	18 21	16 48	15 27	7 76	7 85	8 11	16 80	21 85	18 83
Haliburton	22 36	6 00	20 29	16 05	14 77	8 90	11 38	7 52	17 78	25 46	20 85
Hastings	16 83	20 22	18 15	21 77	15 46	9 28	11 38	8 76	19 86	15 91	21 50
Group	16 72	20 56	18 38	20 73	15 64	9 00	9 62	8 53	20 32	19 58	20 84
Muskoka	11 76	14 67	12 48	12 44	10 87	10 68	11 95	9 89	14 81	21 22	19 91
Parry Sound	13 15	20 00	16 90	14 00	12 54	9 50	8 78	8 06	12 39	21 21	21 26
Nipissing	13 14	.....	13 14	15 21	13 43	4 22	10 76	8 76	15 81	22 50	23 11
Algoma	13 14	12 00	12 77	22 08	13 95	12 66	10 32	9 67	21 74	16 00	22 17
Group	12 36	16 67	13 73	14 77	11 86	10 52	10 89	9 42	17 46	21 63	20 98
The Province	16 28	20 76	17 78	23 59	18 77	8 50	10 66	8 48	15 93	19 70	20 26

VALUE PER ACRE—POTATOES, MANGEL-WURZELS AND CARROTS.

TABLE XX. Showing by County Municipalities and groups of Counties the market value per acre of Potatoes, Mangel-wurzels and Carrots in Ontario in the years 1891 and 1892, with the yearly average for eleven years 1882-92.

Counties.	Potatoes.			Mangel-wurzels.			Carrots.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c	$ c.
Essex	29 03	31 26	44 35	33 12	26 72	32 00	30 38	33 88	31 64
Kent	38 56	41 99	56 70	31 20	40 24	33 24	36 12	48 37	36 74
Elgin	30 44	46 39	44 65	35 36	48 32	34 00	41 13	61 62	41 33
Norfolk	36 54	40 23	47 63	33 52	38 48	31 69	36 38	44 00	35 72
Haldimand	26 61	32 66	47 30	22 56	24 48	26 13	35 38	29 50	33 04
Welland	38 00	34 46	42 67	37 12	41 68	33 86	46 00	36 12	35 69
Group	33 62	38 77	47 65	32 15	38 72	32 13	37 46	45 82	36 36
Lambton	21 27	41 04	43 67	34 80	42 48	32 97	30 25	44 25	36 98
Huron	50 40	53 04	56 30	42 16	44 88	37 54	48 00	52 63	48 85
Bruce	42 08	56 59	52 85	43 12	38 32	34 65	66 25	45 38	43 35
Group	39 99	51 38	52 04	41 35	43 38	36 25	49 40	48 65	44 70
Grey	39 92	51 74	57 43	39 84	31 68	35 30	52 62	44 13	46 31
Simcoe	50 80	49 78	56 64	38 08	38 56	33 00	45 38	50 88	45 53
Group	45 76	50 68	57 03	38 86	35 42	33 89	49 15	47 66	45 91
Middlesex	25 05	50 89	47 49	31 04	48 56	35 43	36 13	61 88	41 35
Oxford	35 99	53 69	49 55	39 68	47 12	38 16	56 63	60 50	50 74
Brant	38 86	49 94	49 94	33 52	50 40	40 01	44 50	58 25	52 40
Perth	40 22	52 88	51 72	33 68	40 64	37 68	45 00	56 75	48 46
Wellington	53 93	50 99	56 55	42 16	38 80	36 23	56 25	51 75	43 22
Waterloo	48 38	49 72	55 24	39 36	43 36	35 26	56 50	57 37	52 10
Dufferin	50 60	52 23	63 23	48 00	38 00	33 94	47 88	39 11	42 34
Group	42 48	51 50	53 27	36 62	44 23	36 92	48 95	58 04	47 00
Lincoln	36 09	41 79	43 46	34 48	40 32	31 87	46 25	43 25	40 40
Wentworth	43 39	46 32	53 00	39 44	43 92	39 39	59 88	51 50	46 94
Halton	35 94	38 57	49 04	34 64	48 24	37 50	45 12	49 87	49 17
Peel	45 16	39 61	46 88	41 52	33 20	32 51	49 00	35 75	43 49
York	45 96	45 43	47 33	38 24	37 68	36 56	52 63	49 50	51 35
Ontario	54 89	49 81	55 44	44 16	40 00	36 95	52 87	50 50	48 91
Durham	53 12	49 45	57 53	42 64	45 68	36 26	61 13	53 75	47 45
Northumberland	65 52	42 67	50 48	40 96	37 28	35 18	51 75	42 00	43 50
Prince Edward	30 59	43 42	41 69	28 00	24 00	23 69	45 87	28 13	27 68
Group	48 31	44 98	49 91	39 47	39 50	35 83	52 92	46 86	47 09
Lennox and Addington	34 07	45 05	50 97	29 36	40 24	27 84	30 87	45 25	35 74
Frontenac	37 14	50 79	46 03	34 00	31 60	28 80	47 50	43 00	33 37
Leeds and Grenville	29 38	52 58	52 19	28 56	38 72	33 01	47 87	40 12	40 32
Dundas	24 70	57 38	62 71	38 40	52 88	34 78	65 63	62 37	52 12
Stormont	20 87	39 38	54 07	22 41	36 00	30 50	37 25	45 88	35 31
Glengarry	23 59	46 00	50 69	34 40	49 60	29 74	38 75	41 25	33 43
Prescott	27 22	60 99	56 56	29 04	36 40	29 94	39 12	45 26	36 38
Russell	31 90	48 77	47 36	27 20	37 04	29 57	36 00	50 00	40 02
Carleton	33 62	55 58	58 80	28 00	35 04	29 88	38 37	45 25	40 65
Renfrew	56 70	58 42	69 39	31 20	35 44	29 10	40 13	41 37	38 82
Lanark	51 61	53 63	64 06	33 84	34 48	32 35	42 25	39 38	43 05
Group	35 13	52 51	56 02	30 46	37 62	30 51	43 98	45 38	39 81
Victoria	51 00	48 41	58 93	50 00	40 56	39 72	64 00	50 00	47 13
Peterborough	50 85	43 52	54 40	33 64	37 36	30 25	58 88	44 50	43 22
Haliburton	67 33	55 16	62 84	26 00	26 43	26 71	39 11	37 26	37 67
Hastings	46 97	46 29	54 77	34 88	33 60	28 32	37 88	36 50	36 28
Group	50 12	46 60	56 20	42 20	36 72	33 76	55 92	43 51	43 00
Muskoka	59 67	55 26	62 69	26 96	26 33	21 74	44 75	44 12	36 00
Parry Sound	76 66	55 35	70 62	44 00	36 00	24 70	42 25	37 13	34 61
Nipissing	84 02	56 04	67 85	32 00	31 00	19 00	37 50	40 00	29 33
Algoma	83 87	65 20	81 09	20 00	26 00	22 71	37 50	38 25	32 77
Group	74 20	57 86	69 77	27 96	28 10	22 32	42 27	40 32	34 87
The Province	42 51	48 95	53 50	37 59	41 04	35 21	48 13	48 36	44 26

VALUE PER ACRE—TURNIPS, HAY, AND ALL FIELD CROPS.

TABLE XXI. Showing by County Municipalities and groups of Counties the market value per acre of Turnips, Hay and Clover and all field crops in Ontario in the years 1891 and 1892, with the yearly average for the eleven years 1882-92.

Counties.	Turnips.			Hay and Clover.			All field crops.		
	1892.	1891.	1882-92.	1892.	1891.	1882-92.	1892.	1891.	1882-92.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	24 70	23 00	27 22	12 05	14 89	16 19	11 72	18 64	17 07
Kent	34 50	43 90	35 09	14 35	13 10	15 80	13 95	19 31	17 21
Elgin	33 50	53 50	35 75	15 74	12 51	15 61	13 63	19 08	16 28
Norfolk	37 30	47 30	38 16	13 61	12 39	13 69	13 57	17 29	14 64
Haldimand	32 80	32 80	29 55	14 10	7 62	12 99	11 68	11 81	13 08
Welland	33 30	38 10	33 38	14 84	11 20	13 86	12 87	15 04	14 04
Group	34 27	44 37	35 44	14 26	11 91	14 67	13 00	17 29	15 60
Lambton	42 60	42 70	34 49	14 51	14 17	15 15	12 16	18 26	15 24
Huron	47 30	56 70	41 19	15 33	10 72	14 53	15 26	17 59	16 04
Bruce	59 60	53 60	42 93	14 10	7 98	13 14	14 72	15 52	15 08
Group	53 06	54 77	41 81	14 69	10 55	14 17	14 35	17 02	15 53
Grey	47 80	56 00	42 02	14 43	10 84	13 01	13 90	15 64	14 66
Simcoe	46 40	57 80	43 10	13 20	12 03	13 69	13 81	17 61	15 58
Group	47 29	56 55	42 33	13 93	11 33	13 28	13 86	16 57	15 09
Middlesex	41 70	61 60	38 29	14 84	14 53	15 83	13 83	19 80	16 33
Oxford	50 50	64 00	44 52	16 73	16 08	16 19	15 65	21 07	17 08
Brant	42 90	65 30	46 19	16 89	14 17	15 04	15 13	19 82	16 49
Perth	48 10	60 10	40 97	16 07	12 98	15 96	15 07	19 80	16 95
Wellington	52 50	60 50	44 21	16 07	12 74	15 55	15 81	18 41	16 91
Waterloo	52 50	54 90	41 67	16 89	10 00	15 80	16 97	18 37	17 42
Dufferin	47 70	55 90	40 53	12 79	13 93	13 75	13 00	17 32	15 20
Group	49 71	60 39	43 07	15 74	13 61	15 61	15 07	19 31	16 70
Lincoln	38 50	43 90	25 56	15 50	11 31	13 90	14 26	15 15	14 65
Wentworth	56 50	58 00	48 32	18 12	10 96	15 12	16 36	17 19	16 49
Halton	42 50	56 40	44 87	16 24	9 53	13 80	14 44	15 67	15 51
Peel	50 50	48 80	39 60	15 66	11 91	14 50	14 45	16 49	15 76
York	45 70	51 20	41 05	15 83	12 62	14 36	14 47	18 07	16 51
Ontario	51 70	54 40	42 87	14 10	13 10	14 50	14 46	19 55	16 71
Durham	55 00	54 60	44 66	12 55	11 91	14 12	12 83	16 97	15 26
Northumberland	52 90	48 10	41 42	12 38	8 69	12 69	12 54	13 93	13 34
Prince Edward	40 00	38 00	24 95	13 37	12 74	13 47	10 98	13 92	12 15
Group	51 28	53 26	43 10	14 87	11 50	14 07	13 85	16 72	15 34
Lennox and Addington	34 00	40 70	26 32	14 51	12 39	12 55	12 01	14 08	12 80
Frontenac	40 90	35 50	29 31	14 19	11 20	12 33	12 68	14 08	13 02
Leeds and Grenville	37 50	45 10	37 32	14 92	8 22	13 22	12 94	13 49	14 02
Dundas	52 50	49 20	32 45	16 40	11 31	15 88	13 97	16 16	16 14
Stormont	22 48	56 30	27 80	12 30	11 91	15 60	11 97	15 10	15 42
Glengarry	54 20	55 00	45 19	14 02	7 74	16 11	12 52	13 02	14 86
Prescott	35 40	50 40	38 19	13 45	14 05	14 87	11 58	16 35	14 30
Russell	45 80	48 30	41 47	14 35	12 98	13 81	12 78	16 95	14 23
Carleton	37 20	52 30	36 86	12 30	11 67	13 65	12 66	18 47	15 37
Renfrew	37 10	45 70	34 20	10 25	8 22	10 81	12 35	13 71	13 41
Lanark	40 30	48 50	37 40	13 45	9 53	13 62	13 10	14 62	14 19
Group	39 56	47 46	35 78	13 63	10 39	13 49	12 63	14 96	14 20
Victoria	51 70	47 60	39 94	12 30	9 29	11 88	12 40	15 70	14 32
Peterborough	46 60	48 50	38 52	11 64	7 74	11 32	11 70	13 38	13 15
Haliburton	31 30	36 90	28 76	10 74	6 43	10 63	11 76	11 20	12 62
Hastings	37 10	37 70	30 16	11 81	7 74	12 42	11 93	12 78	13 26
Group	47 35	45 80	37 57	11 81	8 05	11 90	12 00	13 79	13 54
Muskoka	36 60	38 50	32 13	12 46	6 55	12 32	13 24	11 98	14 23
Parry Sound	30 70	34 60	31 53	12 30	9 65	11 39	13 78	13 26	14 32
Nipissing	32 50	38 90	35 04	12 30	8 10	11 53	16 33	14 11	15 51
Algoma	40 70	36 40	34 97	15 42	6 91	13 07	16 22	13 36	16 49
Group	35 37	36 46	32 68	13 28	7 72	12 26	14 63	12 94	15 01
The Province	49 02	54 61	41 84	14 29	11 18	14 04	13 68	16 70	15 28

FARM WAGES.

TABLE XXII. Showing by County Municipalities and groups of Counties the average wages of Farm Laborers and Domestic Servants in Ontario in 1891 and 1892.

Counties.	Farm laborers.								Domestics per month with board.	
	Per year—				Per month in working season—					
	With board.		Without brd.		With board.		Without board.			
	1892.	1891.	1892.	1891.	1892.	1891.	1892.	1891.	1892.	1891.
	$	$	$	$	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	152	163	252	268	16 32	17 22	26 76	26 70	6 61	6 87
Kent	170	166	262	254	17 04	17 08	25 63	26 10	6 54	6 95
Elgin	169	165	260	259	16 91	17 03	25 25	25 64	6 44	6 34
Norfolk	158	154	239	236	15 14	15 48	23 43	22 96	5 93	5 69
Haldimand	155	149	256	251	17 66	16 79	24 43	25 18	6 06	6 44
Welland	151	147	259	249	17 15	16 19	26 81	24 28	6 52	6 14
Group	159	158	256	253	16 75	16 66	25 62	25 29	6 36	6 39
Lambton	156	157	253	274	17 44	17 46	28 50	26 73	6 66	6 55
Huron	156	161	250	252	16 49	17 02	27 19	26 20	6 06	6 39
Bruce	149	157	262	260	17 01	16 99	26 58	26 00	6 25	6 01
Group	156	159	254	260	16 94	17 13	27 25	26 28	6 28	6 30
Grey	152	150	247	254	15 87	16 56	26 18	26 53	5 90	5 80
Simcoe	149	158	272	272	16 65	18 37	25 57	27 24	6 21	6 22
Group	151	153	260	262	16 30	17 34	25 78	26 86	6 07	5 97
Middlesex	152	155	240	257	16 72	16 11	25 55	24 81	6 73	6 62
Oxford	157	155	245	236	16 61	16 41	24 46	25 29	6 27	6 67
Brant	161	154	250	247	16 25	16 12	25 30	23 84	6 40	6 64
Perth	151	157	265	246	16 10	16 86	26 13	25 53	6 56	6 44
Wellington	163	167	252	266	16 75	17 00	25 36	26 40	6 34	6 33
Waterloo	151	154	258	256	15 66	15 88	26 00	25 62	6 20	6 19
Dufferin	146	159	250	251	16 05	16 43	25 00	27 41	6 31	6 18
Group	154	157	252	250	16 38	16 43	25 49	25 40	6 41	6 46
Lincoln	157	159	255	258	16 91	16 75	26 93	25 26	6 20	6 02
Wentworth	156	153	248	256	16 79	16 97	25 07	26 06	6 87	6 71
Halton	160	174	248	279	16 91	17 13	27 18	26 88	7 31	7 33
Peel	152	163	280	277	17 64	17 96	28 50	27 25	7 85	7 22
York	162	167	256	272	17 09	17 20	27 81	26 80	6 34	6 88
Ontario	164	155	254	268	16 85	16 17	26 55	26 66	6 22	6 12
Durham	156	163	250	255	15 71	15 82	25 75	24 52	6 30	6 36
Northumberland	156	160	253	254	15 70	15 84	25 15	25 20	5 86	6 13
Prince Edward	155	163	229	230	15 15	16 90	23 74	23 95	5 33	5 36
Group	158	162	252	262	16 57	16 76	26 22	25 90	6 42	6 50
Lennox & Addington	143	158	234	231	15 35	16 13	22 89	23 66	5 24	5 08
Frontenac	147	150	245	233	16 31	16 24	23 87	24 57	5 97	5 84
Leeds and Grenville	149	156	241	257	15 94	15 47	23 00	25 10	6 43	6 22
Dundas	154	147	225	250	15 14	15 35	25 40	26 00	6 36	6 30
Stormont	152	166	235	252	16 26	17 86	25 21	26 44	5 68	5 88
Glengarry	138	139	215	255	15 35	15 62	25 08	25 13	5 75	6 10
Prescott	159	158	251	251	16 84	16 34	26 22	23 50	4 92	5 15
Russell	164	166	260	249	16 00	16 73	25 83	26 71	5 18	5 22
Carleton	159	150	246	288	15 60	15 54	27 17	27 41	6 42	6 35
Renfrew	165	159	290	285	16 19	15 57	26 54	25 90	5 58	5 51
Lanark	147	149	259	256	16 83	16 42	25 17	25 86	5 96	5 87
Group	152	154	242	254	15 99	15 99	24 60	25 20	5 83	5 76
Victoria	159	159	269	259	16 64	14 06	28 20	26 96	5 84	5 78
Peterborough	173	178	249	270	16 76	17 21	26 36	27 10	6 21	6 50
Haliburton	151	165	253	255	16 09	17 14	26 83	26 56	5 42	5 63
Hastings	144	161	253	250	15 79	15 70	25 05	24 46	5 51	5 60
Group	154	166	256	258	16 31	15 82	26 28	25 78	5 76	5 90
Muskoka	158	166	250	262	18 49	17 60	26 71	26 76	6 07	6 27
Parry Sound	166	173	253	273	17 54	18 31	26 69	26 86	6 03	5 63
Nipissing	173	181	321	298	18 32	18 31	29 27	28 60	7 00	6 00
Algoma	176	166	291	274	19 43	18 65	30 23	27 20	5 94	6 36
Group	166	169	270	273	18 41	18 19	28 13	27 12	6 16	6 13
The Provinces	156	158	253	257	16 52	16 66	25 92	25 81	6 21	6 25

ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES

FOR THE

PROVINCE OF ONTARIO

1892

PART IV. LOAN AND INVESTMENT COMPANIES.
PART V. CHATTEL MORTGAGES.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
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1893.

ELEVENTH ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES.

PARTS IV AND V.

To the Honorable John Dryden, Minister of Agriculture:

Sir,—I have the honor to present herewith Parts iv and v of the eleventh annual report of the Bureau of Industries, being a statement of the affairs of Loan and Investment Companies and a return by County Court Clerks of Chattel Mortgages on record in Ontario for the year ending Dec. 31, 1892.

I have the honor to be, Sir,

Your obedient servant,

C. C. JAMES,

Secretary.

Toronto, July 27, 1893.

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PART IV.

LOAN AND INVESTMENT COMPANIES OF ONTARIO.

STATEMENT OF AFFAIRS.

In compliance with 54 Vict. chap. 38, sections 23 and 24 of the Statutes of Ontario seventy-six Loan, Building and Investment Companies doing business in Ontario, have made returns of their affairs for the year 1892, being five more than for the previous year. One company, the Royal Standard Loan Company, has ceased to do business, having sold its assets to the London Loan Company of London. Returns have been received by the Bureau for the first time from the following:—East Lambton Farmers' Loan and Savings Company, Forest; Hamilton Mutual Building Society, Hamilton; Owen Sound Building and Savings Society, Owen Sound; Canadian Savings, Loan and Building Association, Toronto; Imperial Trusts Company of Canada, Toronto; York County Loan and Savings Company, Toronto—most of the latter are new companies, and they do not add much to the aggregate of business as reported for 1891.

The following table shows the capital subscribed, the assets and liabilities of the seventy-six companies for 1892, and for comparison, similar totals are also given for the previous five years:

Location of head office of company.	No. of Companies.	Capital subscribed	Liabilities to stock-holders.	Liabilities to the public.	Total liabilities or assets.	Secured loan assets.	Property assets.
		$	$	$	$	$	$
Hamilton	4	3,011,570	2,413,643	3,503,694	5,917,337	5,435,041	482,296
Kingston	2	450,000	513,415	529,029	1,042,444	817,540	224,904
London	7	10,225,500	7,717,725	10,720,017	18,437,742	16,626,308	1,811,434
Ottawa	3	638,200	494,499	43,727	538,226	401,056	137,170
Owen Sound	2	453,000	147,577	90,522	238,099	235,367	2,732
St. Thomas	5	2,427,450	1,305,296	1,004,218	2,309,514	2,189,435	120,079
Sarnia	3	1,084,200	1,294,911	1,241,611	2,536,522	2,462,417	74,105
Stratford	2	610,000	414,693	557,822	972,515	970,526	1,989
Toronto	33	54,793,507	26,601,479	52,526,209	79,127,688	69,710,724	9,416,964
Other places	15	6,584,850	4,990,504	7,510,579	12,501,083	10,402,665	2,098,418
Totals, 1892	76	80,278,277	45,893,742	77,727,428	123,621,170	109,251,079	14,370,091
1891	71	76,152,817	44,379,397	72,757,149	117,136,546	104,365,025	12,771,521
1890	67	70,672,710	42,673,552	65,544,199	108,217,751	98,111,032	10,106,719
1889	71	69,694,221	41,629,987	62,967,156	104,597,143	94,666,887	9,930,256
1888	64	67,939,559	40,108,161	59,540,175	99,648,336	89,042,190	10,606,146
1887	55	56,114,310	35,910,563	51,177,104	87,087,667	79,035,804	8,051,863

LOAN AND INVESTMENT COMPANIES.

List of companies reporting Statement of affairs as required by Vict. 54, chapter 38, section 23.

Name of Company.	When Organized.	President.	Manager.	Head Office.	For year ending
Barrie Loan and Savings Company	April 14, 1881.	N. Dyment	Robert Laidlaw	Barrie	Dec. 31, 1892.
Hastings Loan and Investment Society	January, 1876.	Hon. Mackenzie Bowell.	J. P. C. Phillips	Belleville	Dec. 31, 1892.
Royal Loan and Savings Company	June 1, 1876.	T. S. Shenston	R. S. Schell	Brantford	Dec. 31, 1892.
Brockville Loan and Savings Company	July 1, 1885.	D. B. Jones	G. H. Weatherhead	Brockville	Dec. 31, 1892.
Chatham Loan and Savings Company	Sept. 28, 1881.	Archibald Bell	S. F. Gardiner	Chatham	Dec. 31, 1892.
East Lambton Farmers' Loan and Savings Company	Dec. 18, 1891.	James Hutton, M. D.	W. Lemon	Forest	Feb. 28, 1893.
Huron and Bruce Loan and Investment Company	April 17, 1885.	Joseph Williams	Horace Horton	Goderich	Dec. 31, 1892.
Guelph and Ontario Investment and Savings Society	1876.	David Stirton	William Ross	Guelph	Dec. 31, 1892.
Hamilton Homestead Loan and Savings Society	Jan. 1, 1883.	James E. O'Reilly	I. A. Studdart	Hamilton	Dec. 31, 1892.
Hamilton Mutual Building Society	Dec. 1, 1890.	Alfred Ward	Walter Anderson	Hamilton	Nov. 30, 1892.
Hamilton Provident and Loan Society	Sep. 1871.	George H. Gillespie	H. D. Cameron	Hamilton	Dec. 31, 1892.
Landed Banking and Loan Company	February, 1877.	Matthew Leggat	C. W. Cartwright	Hamilton	Dec. 31, 1892.
Frontenac Loan and Investment Society	Dec., 1863.	Sir R. J. Cartwright	Thomas Briggs	Kingston	Dec. 31, 1892.
Ontario Building and Savings Society	June 25, 1874.	C. V. Price	James McArthur	Kingston	Dec. 31, 1892.
Agricultural Savings and Loan Company	May, 1872.	William Glass	W. A. Lipsey	London	Dec. 31, 1892.
Canadian Savings and Loan Company	October, 1875.	Robert Fox	Hiram W. Blinn	London	May 31, 1892.
Dominion Savings and Investment Society	April, 1872.	Robert Reid	H. E. Nelles	London	Dec. 31, 1892.
Huron and Erie Loan and Savings Company	1864.	John W. Little	George A. Somerville	London	Dec. 31, 1892.
London Loan Company	1877.	Thomas Kent	Malcolm John Kent	London	Dec. 31, 1892.
Ontario Investment Association	April, 1880.	John Wright	A. T. McMahon	London	Dec. 31, 1892.
Ontario Loan and Debenture Company	1870.	Joseph Jeffery	William F. Bullen	London	Dec. 31, 1892.
Orangeville Building and Loan Association	1873.	F. C. Stewart	Francis Irwin	Orangeville	Dec. 31, 1892.
Ontario Loan and Savings Company	February, 1873.	W. F. Cowan	T. H. McMillan	Oshawa	Dec. 31, 1892.
Home Building and Savings Association	Sept. 1890.	John R. Armstrong	C. A. Douglas	Ottawa	Aug. 31, 1892.
Metropolitan Loan and Savings Company	August, 1870.	H. V. Noel	C. R. Cunningham	Ottawa	Dec. 31, 1892.
Ottawa Building and Loan Society	June 6, 1884	A. Smirle	C. A. Douglas	Ottawa	May 31, 1892.
Owen Sound, Grey and Bruce Loan and Savings Company	April 15, 1889.	William Roy	W. P. Telford	Owen Sound	Dec. 31, 1892.
Owen Sound Building and Savings Society	April 1, 1889	George Inglis	Alf J. Spencer	Owen Sound	Oct. 31, 1892.
Central Canada Loan and Savings Company	April 1, 1884.	George A. Cox	Fred. G. Cox	Peterborough	Dec. 31, 1892.
Crown Savings and Loan Company	Jan. 30, 1882.	John H. Fairbank	John Fraser	Petrolea	Dec. 31, 1892.
Midland Loan and Savings Company	1873.	John Mulligan	George M. Furby	Port Hope	Dec. 31, 1892.
Security Loan and Savings Company	March 15, 1870.	Thomas R. Merritt	E. F. Dwyer	St. Catharines	Dec. 31, 1892.
Atlas Loan Company	August, 1877.	Hon. Richard Harcourt	A. E. Wallace	St. Thomas	Dec. 31, 1892
Elgin Loan and Savings Company	May 1, 1879.	Edward Miller	George Rowley	St. Thomas	Dec. 31, 1892.
Southern Loan and Savings Company	1870.	Samuel Eccles	J. W. Stewart	St. Thomas	Dec. 31, 1892.
Southwestern Farmers' and Mechanics' Savings and Loan Society	Feb. 18, 1875.	E. W. Gustin, M. D.	W. E. Leonard	St. Thomas	Dec. 31, 1892.
Star Loan Company	August 31, 1881.	Hon. David Mills	Daniel M. Tait	St. Thomas	Feb. 28, 1893.
Huron and Lambtan Loan and Savings Company	Nov. 1877.	James Flintoft	J. C. Douglas	Sarnia	Dec. 31, 1892.
Industrial Mortgage and Savings Company	October, 1889.	James F. Lister	J. S. Symington	Sarnia	Dec. 31, 1892.
Lambton Loan and Investment Company	1844.	Chas. Mackenzie, M.P.P.	Robert S. Gurd	Sarnia	June 30, 1892.

LOAN AND INVESTMENT COMPANIES.—*Concluded.*

Name of Company.	When Organized.	President.	Manager.	Head Office.	For year ending
British Mortgage Loan Company	October, 1877.	Hon. Thomas Ballantyne.	William Buckingham	Stratford	Dec. 31, 1892.
Stratford Building and Savings Society	August 22, 1889.	M. F. Goodison	D. B. Burritt	Stratford	Sept. 30, 1892.
Bristol and West of England Canadian Land, Mortgage and Investment Company	March 25, 1878.	Sir George W. Edwards. T. Sutherland Stayner.	Wm. Smith & Co	Bristol, England Toronto	Dec. 31, 1892.
British Canadian Loan and Investment Company	July 1, 1877.	A. H. Campbell	R. H. Tomlinson	Toronto	Dec. 31, 1892.
Building and Loan Association	March 1, 1870.	Larratt W. Smith, Q.C.	Walter Gillespie	Toronto	Dec. 31, 1892.
Canadian Homestead Loan and Savings Association	Sept. 1886.	John Hillock	A. J. Pattison	Toronto	Sep. 30, 1892.
Canadian Mutual Loan and Investment Company	June 14, 1890.	John J. Withrow	A. J. Jackson	Toronto	July 31, 1892.
Canadian Landed and National Investment Company	1858.	John Lang Blaikie	Andrew Rutherford	Toronto	Dec. 31, 1892.
Canada Permanent Loan and Savings Company	1855.	J. Herbert Mason	Geo. H. Smith	Toronto	Dec. 31, 1892.
Canadian Savings, Loan and Building Association	March 28, 1890.	E. W. D. Butler	Daniel Rose	Toronto	June 30, 1892.
City and County Loan Association	Jan. 26, 1889.	Ambrose Kent	John C. Laidlaw	Toronto	Dec. 31, 1892.
Dominion Building and Loan Association	May 1, 1890.	F. A. Hall	F. M. Holland	Toronto	April 30, 1892.
Dovercourt Land, Building and Savings Company	Dec. 16, 1885.	James Brandon	James T. Locke	Toronto	Dec 31, 1892.
Farmers' Loan and Savings Company	October, 1871.	William Mulock, M. P.	George S. C. Bethune	Toronto	April 30, 1892.
Freehold Loan and Savings Company	May, 1859.	C. H. Gooderham	Hon. S. C. Wood	Toronto	April 30, 1892.
Home Savings and Loan Company	April, 25, 1877.	Hon. Frank Smith	James Mason	Toronto	Dec. 31, 1892.
Imperial Loan and Investment Company	Sept. 14, 1869.	James Thorburn, M.D.	E. H. Kirkland	Toronto	Dec. 31, 1892.
Imperial Trusts Company	March, 1889.	Sir Leonard Tilly, KCMG	Frederick S. Sharpe	Toronto	Dec. 31, 1892.
Land Security Company	Dec. 1873.	Major George Greig	Wm. Innes Mackenzie	Toronto	Dec. 31, 1892.
London and Canadian Loan and Agency Company	January 1, 1873.	Sir W. P. Howland, C.B. K.C.M.G.	James Ferrier Kirk	Toronto	Aug. 31, 1892.
London and Ontario Investment Company	May 15, 1877.	Hon. Frank Smith	Alfred Morgan Cosby	Toronto	June 30, 1892.
North British Canadian Investment Company	Oct. 14, 1876.	Peter Sturrock	James L. Scarth	Glasgow, Scot. Toronto	Dec. 31, 1892.
North of Scotland Canadian Mortgage Company	Dec. 17, 1875.	James W. Barclay, M. P.	William Smith Osler and Hammond	Aberdeen, Scot. Toronto	Nov. 11, 1892.
Ontario Industrial Loan and Investment Company	Jan. 5, 1880.	William Booth	E. T. Lightbourn	Toronto	Dec. 31, 1892.
People's Loan and Deposit Company	March, 1875.	William Elliot	James Watson	Toronto	Dec. 31, 1892.
Real Estate Loan Company of Canada	Dec. 1879.	T. R. Wadsworth	B. Morton	Toronto	Dec. 31, 1892.
Scottish Ontario and Manitoba Land Company	Dec. 15, 1879.	Robert Young	James L. Scarth	Glasgow, Scot. Toronto	Dec. 31, 1892.
Sons of England Building, Loan and Savings Association	April 30, 1889.	S. B. Pollard, M.D	F. J. Davis	Toronto	Dec. 31, 1892.
Toronto Land and Loan Company	May 27, 1881.	Arthur Harvey	W. C. Beddome	Toronto	Aug. 31, 1892.
Toronto Savings and Loan Company	June 15, 1885.	Robert Jaffray	A. E. Ames	Toronto	Dec. 31, 1882.
Toronto General Trusts Company	February, 1882.	Hon. Edward Blake, Q.C.	J. W. Langmuir	Toronto	Mar. 31, 1893.
Trust and Loan Company of Canada	Oct. 1, 1851.	Charles Morrison	William B. B. Simpson Richard J. Evans	London, Eng. Toronto	Sep. 30, 1892.
Union Loan and Savings Company	March, 1865.	James McGee	William Maclean	Toronto	Dec. 31, 1892.
Western Canada Loan and Savings Company	March, 1863.	Hon. George W. Allan	Walter S. Lee	Toronto	Dec. 31, 1892.
York County Loan and Savings Company	Dec. 8, 1891.	W. B. Nesbitt	Andrew Wall	Toronto	Dec. 31, 1892.
Oxford Permanent Loan and Savings Company	1865.	William Gray	William Grey	Woodstock	Dec. 31, 1892.

TABLE I. Statement of affairs showing the capital stock, liabilities and assets of 76 Loan and Investment Companies in the Province of Ontario for the year 1892, as required to be furnished by Chapter 169, Section 83, R. S. O. 1887, or by provisions of special charters; also a miscellaneous summary of the business transacted by each company during the year.

Schedule.	Barrie Loan, Barrie.	Hastings Loan, Belleville.	Royal Loan, Brantford.	Brockville Loan, Brockville.	Chatham Loan, Chatham.	East Lambton Loan, Forest.	Huron and Bruce Loan, Goderich.	Guelph and Ontario Society, Guelph.	Hamilton Homestead, Hamilton.	Hamilton Mutual, Hamilton.
Capital Stock.	$	$	$	$	$	$	$	$	$	$
Capital authorized	250,000	250,000	500,000	500,000	1,000,000	500,000	500,000	1,000,000	1,000,000	600,000
Capital subscribed	250,000	225,000	500,000	250,000	349,300	100,100	218,600	660,000	286,170	525,400
Liabilities.										
Liabilities to stockholders:										
Stock fully paid up			499,000				132,000	348,350		
Stock on which has been paid	117,500	205,559	300	125,220	189,735	51,630	38,374	62,000	68,618	12,822
Accumulating stock								392	1,995	
Reserve fund	8,500	20,000	93,000	7,500	9,850	115		135,500		
Dividends declared and unpaid	3,525	6,151	17,475	19			5,094	16,187		
Contingent fund and unappropriated profits	1,840	3,736	10,270	724			3,361	2,516	38,268	5,034
Total	131,365	235,446	620,045	133,463	199,585	51,745	178,829	564,945	108,881	17,856
Liabilities to the public:										
Deposits	29,378	164,276	464,922	86,324	264,643	10,466	122,014	518,923		
Debentures payable in Canada	15,329		350,479		409			588,997		
Debentures payable elsewhere		48,667								
Interest on debentures due and accrued			5,440					13,649		
Interest on deposits due and accrued			2,544	2,604		217	4,800	8,678		
Owing to banks										
Other liabilities	8		125							
Total	44,715	212,943	823,510	88,928	265,052	10,683	126,814	1,130,247		
Assets.										
Secured loan assets:										
Real estate of—										
General borrowers	161,753	348,002	1,293,745	193,684	422,328	61,019	261,278	1,608,196	100,547	14,473
Directors and executive officers of company									3,950	
Held under power of sale	8,213	30,400	19,969		14,325					
Shareholders' stock		6,295	9,645	3,604			7,100	2,894		
Directors and officers of company on their stock			2,600							
Otherwise secured			576	200				2,565		
Total	169,966	384,697	1,326,535	197,488	436,653	61,019	268,378	1,613,655	104,497	14,473

Property assets :											
Municipal and school section securities, cash value				97,309					5,924		
Office furniture and fixtures			1,638	208	293	435	343	590		175	
Cash on hand		603	1,048	1,921	134	5,023	11	2,064			13
Cash in banks		5,511	19,006	17,582	4,860	12,172	1,055	23,316	66,628	1,447	124
Special deposit in banks			42,000								
Office premises						10,354					
Real estate absolutely foreclosed					19,616			11,295	8,985		
Real estate otherwise acquired										600	
Other property										2,162	3,246
Total		6,114	63,692	117,020	24,903	27,984	1,409	37,265	81,537	4,384	3,383
Grand total *assets* or *liabilities*		176,080	448,389	1,443,555	222,391	464,637	62,428	305,643	1,695,192	108,881	17,856
Miscellaneous.											
Dividends declared in year	Rate per cent	7.	6.	7.	6.	7.	5.	6.	8.		
	Amount	7,638	12,157	34,951	7,501	11,570	1,441	10,085	32,097		
Loaned during the year		27,497	38,254	288,399	52,355	117,820	63,001	33,074	269,422	19,294	8,200
Received from borrowers (principal and interest)		38,865	57,148	222,165	50,191	76,524	3,905	32,635	262,055	5,447	958
Received from depositors		35,097	170,239	771,227	55,202	487,502	24,813	117,927	957,445	†18,781	
Repaid depositors		33,108	139,043	733,951	48,972	463,739	14,347	99,854	921,752	†26,039	
Debentures issued				169,254					117,022		
Debentures repaid				99,936		1,000			52,571		
Debentures to mature within one year		15,000		70,381					115,599		
Average rate of interest	For debentures	5.00	5.00	4.72		4.50			4.08		
	For deposits	4.00	4.00	3.75	4.00	4.00	4.00	4.25	3.60		
Interest paid and accrued	On debentures	750	2,433	14,320		50			27,171		
	On deposits	1,066	5,283	16,450	3,310	9,401	351	4,800	18,789		
Cost of management		986	2,991	7,397	1,324	4,290	297	1,564	9,266	1,298	345
Invested and secured by mortgage	In Ontario	169,966	378,402	1,313,714	192,084	436,653	61,019	261,278	1,608,196	‡104,497	14,473
	Elsewhere				1,600						
Mortgages by instalments		480		3,618	25,285	68,094			190,266		14,473
Mortgages at stated period		169,486	378,402	1,310,096	168,399	368,559	61,019	261,278	1,417,930	104,497	
Average interest on total amount secured by mortgage		6.75	6.50	6.30	6.50	6.68		6.50	6.21		5.50
Average interest on amount loaned on mortgage in year		6.25	6.25	6.03	6.50	6.19	6.00	6.25	6.06		5.50
Mortgages on which compulsory proceedings have been taken	Number	7	1	19		1		2	2		
	Amount	8,212	5,000	36,431		1,707		5,000	8,985		
Value of mortgaged property held for sale		9,500	40,000	21,570		16,800					
Amount chargeable against such property		8,213	30,400	19,969		14,325					

† Members only for dues and withdrawals.

‡ In city of Hamilton only.

TABLE I. LOAN AND INVESTMENT COMPANIES—*Continued.*

Schedule.	Hamilton Provident, Hamilton.	Landed Banking, Hamilton.	Frontenac Loan, Kingston.	Ontario Building, Kingston.	Agricultural Savings, London.	Canadian Savings, London.	Dominion Savings, London.	Huron and Erie Loan, London	London Loan, London,	Ontario Investment, London.
Capital Stock.	$	$	$	$	$	$	$	$	$	$
Capital authorized	1,500,000	700,000	Unlimited	250,000	1,000,000	Unlimited	1,500,000	2,500,000	Unlimited	3,000,000
Capital subscribed	1,500,000	700,000	200,000	250,000	630,200	750,000	1,000,000	2,500,000	679,700	2,665,600
Liabilities.										
Liabilities to stockholders :										
Stock fully paid up	1,000,000		200,000	250,000				1,000,000		
Stock on which has been paid	100,000	658,000			618,500	722,000	932,050	300,000	656,750	678,586
Accumulating stock		10,057			6,779	6,625	177		2,413	
Reserve fund	290,000	135,000	30,000		110,000	195,000	10,000	626,000	69,000	
Dividends declared and unpaid	38,500	19,737	5,187	6,377	18,555			58,577		
Contingent fund and unappropriated profits	28,000	7,612	4,718	17,133	1,179	21,818	21,608	4,747	259	
Total	1,456,500	830,406	239,905	273,510	755,013	945,443	963,835	1,989,324	728,422	678,586
Liabilities to the public :										
Deposits	1,049,967	652,466	277,762	249,391	596,989	726,449	648,731	1,292,126	655,394	866
Debentures payable in Canada	205,171	260,540			302,276	113,686	60,511	764,195	167,076	
Debentures payable elsewhere	*1,115,051	163,264			160,897	36,500	862,180	1,501,637	100,496	
Interest on debentures due and accrued	12,336	5,441			5,078	3,216	5,792	25,496	2,868	
Interest on deposits due and accrued		1,767						497		
Owing to banks										
Other liabilities	34,960	2,731	23	1,853	549	41	225			†187,366
Total	2,417,485	1,086,209	277,785	251,244	1,066,789	879,892	1,577,439	3,583,951	925,834	188,232
Assets.										
Secured loan assets :										
Real estate of—										
General borrowers	3,378,098	1,769,323	297,825	314,831	1,674,548	1,712,898	2,147,794	5,228,068	1,563,192	152,398
Directors and executive officers of company		1,809	34,685	3,746						
Held under power of sale	128,218	23,764	41,720	49,087	19,958	19,655	188,284	2,350	26,964	11,850
Shareholders' stock	14,859		6,518	10,444	17,803	32,741	160,728		24,355	
Directors and officers of company on their stock			23,802	18,332		1,644			1,216	
Otherwise secured				16,550		33		60,600		20,777
Total	3,521,175	1,794,896	404,550	412,990	1,712,309	1,766,971	2,496,806	5,291,018	1,615,727	185,025

Property assets :											
Municipal and school section securities, cash value	49,272	14,662	5,871	31,395	2,397	484	.....	67,424	5,075	.....	
Office furniture and fixtures	.....	.....	189	87	500	.....	1,000	.....	500	.....	
Cash on hand	3,904	3,658	1,002	31	2,328	.....	91	7,607	16,797	.....	
Cash in banks	145,608	46,842	26,564	53,112	52,838	.....	43,377	6,343	14,157	14,386	
Special deposit in banks	50,000	10,000	.....	20,741	20,000	33,880	.....	181,883	.....	.....	
Office premises	96,526	.....	3,716	.....	28,000	24,000	.....	19,000	.....	.....	
Real estate absolutely foreclosed	.....	3,841	30,407	.....	.....	.....	.....	.....	.....	5,100	
Real estate otherwise acquired	7,500	17,989	5,621	5,672	2,014	.....	.....	.....	.....	23,516	
Other property	.....	24,727	39,770	726	1,416	.....	.....	.....	2,000	‡638,791	
Total	352,810	121,719	113,140	111,764	109,493	58,364	44,468	282,257	38,529	681,793	
Grand total *assets* or *liabilities*	3,873,985	1,916,615	517,690	524,754	1,821,802	1,825,335	2,541,274	5,573,275	1,654,256	866,818	
Miscellaneous.											
Dividends declared in year { Rate per cent	7.	6.	5.	5.	6½.	7.	6.	9.	6.	.....	
Dividends declared in year { Amount	77,000	40,123	10,000	12,500	40,617	49,988	55,947	117,000	39,338	.....	
Loaned during the year	740,239	390,296	117,874	85,317	362,482	212,802	720,222	1,022,274	1,026,789	8,375	
Received from borrowers (principal and interest)	949,507	362,235	141,729	128,085	284,593	277,378	944,756	765,595	966,254	155,467	
Received from depositors	793,171	1,304,432	438,806	391,109	645,584	1,065,197	1,142,582	1,324,668	1,738,995	.....	
Repaid depositors	850,726	1,231,556	445,295	381,191	632,637	1,029,843	1,163,208	1,382,303	1,699,449	1,069	
Debentures issued	155,977	95,810	.....	.....	208,453	78,700	113,892	938,902	157,933	.....	
Debentures repaid	81,359	99,071	.....	.....	108,630	92,300	156,821	445,848	59,700	.....	
Debentures to mature within one year	283,364	128,573	.....	.....	130,433	66,686	297,280	321,792	29,276	.....	
Average rate of interest { For debentures	4.17	4.81	.....	.....	4.66	4.76	4.33	4.22	4.59	.....	
Average rate of interest { For deposits	3.68	3.73	3.67	3.72	3.97	4.23	4.20	4.00	5.13	.....	
Interest paid and accrued { On debentures	52,579	19,796	.....	.....	17,654	6,940	41,145	83,166	12,721	12,557	
Interest paid and accrued { On deposits	39,349	23,739	9,742	10,271	24,399	29,384	31,853	52,770	35,233	.....	
Cost of management	35,645	14,307	4,051	2,443	13,328	10,063	14,644	34,453	11,846	.....	
Invested and secured by mortgage { In Ontario	3,180,098	1,525,464	291,977	367,664	1,694,506	1,732,553	2,336,078	5,230,418	1,590,156	164,248	
Invested and secured by mortgage { Elsewhere	326,218	269,432	82,253	.....	.....	.....	.....	.....	.....	.....	
Mortgages by instalments	2,440,000	46,220	374,230	149,488	24,843	12,687	471,641	954,033	786,917	.....	
Mortgages at stated period	1,066,316	1,748,676	.....	218,176	1,669,663	1,719,866	1,864,437	4,276,385	803,239	164,248	
Average interest on total amount secured by mortgage	6.37	6.53	5.53	6.23	6.25	6.35	6.32	6.19	6.00	.....	
Average interest on amount loaned on mortgage in year	6.85	6.59	6.09	6.11	6.05	6.16	6.15	6.01	6.00	.....	
Mortgages on which compulsory proceedings have been taken { Number	36	20	.....	5	5	8	28	13	5	2	
Mortgages on which compulsory proceedings have been taken { Amount	81,024	30,656	.....	8,899	14,040	13,103	59,815	41,729	18,897	6,500	
Value of mortgaged property held for sale	128,218	23,764	40,296	41,300	19,958	24,000	185,850	2,350	29,200	11,850	
Amount chargeable against such property	128,218	23,764	41,720	49,087	19,958	19,655	188,284	2,350	26,964	11,850	

* Including $378,383 debenture stock. † In liquidation, including $182,816 owing to Dominion Savings Society. ‡ Estimated loss on realizing on assets.

TABLE I. LOAN AND INVESTMENT COMPANIES—*Continued.*

Schedule.	Ontario Loan, London.	Orangeville Building, Orangeville.	Ontario Loan, Oshawa.	Home Building and Savings, Ottawa.	Metropolitan Loan, Ottawa.	Ottawa Building, Ottawa.	Owen Sound, Grey and Bruce, Owen Sound.	Owen Sound Building and Savings, Owen Sound.	Central Canada Loan, Peterborough.	Crown Savings, Petrolea.
Capital Stock.	$	$	$	$	$	$	$	$	$	$
Capital authorized	Unlimited	50,000	300,000	1,000,000	320,000	Unlimited	300,000	1,000,000	5,000,000	1,000,000
Capital subscribed	2,000,000	24,550	300,000	141,400	320,000	176,800	268,950	184,050	2,500,000	189,650
Liabilities.										
Liabilities to stockholders:										
Stock fully paid up	1,000,000	18,093	299,000				46,700		625,000	119,300
Stock on which has been paid	200,000	3,867	390	14,761	310,560	116,364	59,290		375,000	32,884
Accumulating stock					32			32,328		
Reserve fund	415,000	362	75,000		30,000		600		250,000	14,000
Dividends declared and unpaid	42,000	96			9,317		3,123		26,867	4,462
Contingent fund and unappropriated profits	102	1,127	8,000	473	12,991	1	96	5,440	23,407	455
Total	1,657,102	23,545	382,390	15,234	362,900	116,365	109,809	37,768	1,300,274	171,101
Liabilities to the public:										
Deposits	477,508		302,968		43,459		55,805	6,047	647,700	47,218
Debentures payable in Canada	140,348		205,400				14,520		702,050	12,121
Debentures payable elsewhere	1,860,004								1,480,391	
Interest on debentures due and accrued	20,020		45				201		19,114	
Interest on deposits due and accrued							727	200	7,714	
Owing to banks		158	46,014					4,339		
Other liabilities		42		192		76	8,521	162	29,430	
Total	2,497,880	200	554,427	192	43,459	76	79,774	10,748	2,886,399	59,339
Assets.										
Secured loan assets:										
Real estate of—										
General borrowers	3,493,176	23,674	724,678	14,056	245,103	74,000	186,927	43,710	2,175,612	209,517
Directors and executive officers of company	775		2,798			40,200		1,600		
Held under power of sale	28,440		70,000					300	33,141	
Shareholders' stock	20,570		7,213	385	6,103			2,424		
Directors and officers of company on their stock	15,491		7,759		20,789					
Otherwise secured						426	3	403	508,069	
Total	3,558,452	23,674	812,448	14,435	271,995	114,626	186,930	48,437	2,716,822	209,517

Property assets :										
Municipal and school section securities, cash value	24,409		21,940		417				77,208	17,509
Office furniture and fixtures			500	75	460		165	55	3,500	14
Cash on hand		71	360				124		3,293	
Cash in banks	87,426		6,919	685	19,602	1,815	2,364		59,584	3,213
Special deposit in banks	330,988		50,000							187
Office premises	72,000		11,000		17,176				30,110	
Real estate absolutely foreclosed					96,709				31,302	
Real estate otherwise acquired	689		20,000							
Other property	81,018		13,650	231				24	*1,264,854	
Total	596,530	71	124,369	991	134,364	1,815	2,653	79	1,469,851	20,923
Grand total *assets* or *liabilities*	4,154,982	23,745	936,817	15,426	406,359	116,441	189,583	48,516	4,186,673	230,440
Miscellaneous.										
Dividends declared in year { Rate per cent	7.	5.	7.		6.		6.	10.	6.	6.
Dividends declared in year { Amount	84,000	1,084	20,951		18,635		6,178	2,424	51,762	8,828
Loaned during the year	702,284	2,700	90,350	7,085	50,182	14,500	58,200	12,909	676,409	40,664
Received from borrowers (principal and interest)	656,960	2,858	100,723		86,957		14,369	11,248	1,122,466	43,225
Received from depositors	522,946		299,239		42,764		165,231	10,467	828,000	48,102
Repaid depositors	515,672		289,301		46,337		133,939	11,521	651,763	45,757
Debentures issued	619,410		42,900				14,520		744,454	
Debentures repaid	101,227		7,800						167,027	7,903
Debentures to mature within one year	332,600								470,593	
Average rate of interest { For debentures	4.14		4.50				5.00		4.61	5.00
Average rate of interest { For deposits	3 93		3.75		3.75		4 to 5	5.50	4.63	4.00
Interest paid and accrued { On debentures	69,962		8,000				293		82,489	637
Interest paid and accrued { On deposits	19,867		13,737		1,636		2,123	473	25,480	1,914
Cost of management	28,729	119	5,733	447	2,033	542	895	697	27,550	1,395
Invested and secured by mortgage.. { In Ontario	3,460,536	23,674	797,476	14,050	245,103	114,200	186,927	45,610	2,208,753	209,517
Invested and secured by mortgage.. { Elsewhere	61,855									
Mortgages by instalments	1,358,690	1,865	300,000	14,050	4,770	114,200				209,517
Mortgages at stated period	2,163,701	21,809	497,476		240,333		186,927	45,610	2,208,753	
Average interest on total amount secured by mortgage	6.22	5.46	6.00	8.00	6.50	6.50	7.00	9 60	6.25	6.60
Average interest on amount loaned on mortgage in year	5.94	6.81	6.00	8.40	6 50	6.00	6.75	9.60	6.04	6.15
Mortgages on which compulsory proceedings have been taken { Number	17		2		1			1	26	
Mortgages on which compulsory proceedings have been taken { Amount	30,500		8,000		4,984			300	77,385	
Value of mortgaged property held for sale	28,440		75,000					300	33,141	
Amount chargeable against such property	28,440		70,000					300	33,141	

* Including $1,252,175 in stocks, bonds and debentures.

TABLE I. LOAN AND INVESTMENT COMPANIES—*Continued.*

Schedule.	Midland Loan, Port Hope.	Security Loan, St. Catharines.	Atlas Loan, St. Thomas.	Elgin Loan, St. Thomas.	Southern Loan, St. Thomas.	Southwestern Farmers' and Mechanics', St. Thomas.	Star Loan, St. Thomas.	Huron and Lambton Loan, Sarnia.	Industrial Mortgage, Sarnia.	Lambton Loan, Sarnia.
Capital Stock.	$	$	$	$	$	$	$	$	$	$
Capital authorized	560,000	300,000	2,000,000	625,000	Unlimited	Unlimited	270,000	1,000,000	500,000	1,000,000
Capital subscribed	499,350	275,000	1,000,000	625,000	400,000	141,650	260,800	399,200	185,000	500,000
Liabilities.										
Liabilities to stockholders:										
Stock fully paid up	310,000				400,000	136,800	180,100	294,000		
Stock on which has been paid	37,870	274,256	236,067	202,317		1,726		9,620	167,098	497,220
Accumulating stock						4	27,579	25,083		
Reserve fund	75,000		5,000	19,000	63,000	9,700	12,500	40,000	9,837	234,000
Dividends declared and unpaid	11,957	8,228				4,145				
Contingent fund and unappropriated profits	8,127	3,183	580	240	1,349	1,019	4,170	15,036		3,017
Total	442,954	285,667	241,647	221,557	464,349	153,394	224,349	383,739	176,935	734,237
Liabilities to the public:										
Deposits	273,092	309,097	223,719	131,135	288,940	133,499	141,302	297,903	192,305	480,892
Debentures payable in Canada	584,424	19,016	82,300						44,804	180,775
Debentures payable elsewhere										
Interest on debentures due and accrued	15,884								412	3,568
Interest on deposits due and accrued									6,743	17,642
Owing to banks									8,236	8,331
Other liabilities							323			
Total	873,400	328,113	306,019	131,135	288,940	133,499	144,625	297,903	252,500	691,208
Assets.										
Secured loan assets:										
Real estate of—										
General borrowers	1,170,329	527,979	511,495	298,541	719,091	263,817	326,811	503,193	403,518	1,255,111
Directors and executive officers of company				2,472		2,036		21,974		4,505
Held under power of sale	63,791	57,335		13,380	13,629		9,228	23,849		11,945
Shareholders' stock	7,148	4,868	2,600	5,164	4,512	832	12,244	43,048	3,715	32,417
Directors and officers of company on their stock	5,500			515	698	1,502	868			3,524
Otherwise secured	5,291	10,926						75,657	20,342	59,619
Total	1,252,059	601,108	514,095	320,072	737,930	268,187	349,151	667,721	427,575	1,367,121

Property assets:											
Municipal and school section securities, cash value					6,934	4,448					
Office furniture and fixtures	784	246								850	1,000
Cash on hand	800								2,159	1,010	4,324
Cash in banks	26,744	12,339	33,571	9,746	8,425	1,613	16,678	11,762			
Special deposit in banks	15,000			20,463							45,000
Office premises	6,767						3,025				8,000
Real estate absolutely foreclosed	14,131					7,159					
Real estate otherwise acquired				2,411		5,486					
Other property	69	87					120				
Total	64,295	12,672	33,571	32,620	15,359	18,706	19,823	13,921	1,860	58,324	
Grand total *assets* or *liabilities*	1,316,354	613,780	547,666	352,692	753,289	286,893	368,974	681,642	429,435	1,425,445	
Miscellaneous.											
Dividends declared in year { Rate per cent	7.	6.	6.	6.	7.	6.	6.	6½.	6.	8.	
{ Amount	23,870	16,455	12,705	11,703	28,000	8,306	11,568	21,294	9,052	39,732	
Loaned during the year	221,724	153,503	255,374	42,954	133,768	83,186	83,916	117,638	175,865	208,541	
Received from borrowers (principal and interest)	219,344	119,928	127,957	48,300	123,790	45,238	74,002	166,286	55,547	246,834	
Received from depositors	449,208	325,091	374,888	236,765	304,316	165,604	165,245	316,046	405,807	499,965	
Repaid depositors	424,421	323,827	305,836	232,183	281,782	148,924	163,729	358,650	357,184	454,793	
Debentures issued	301,838	5,780	59,500						30,394	63,325	
Debentures repaid	281,242	8,043							4,700	57,250	
Debentures to mature within one year	406,392	17,992	9,300						2,600	27,886	
Average rate of interest { For debentures	4.70	4.50	5.01						4.50	4.50	
{ For deposits	4.08	3.75	4.01	4.00	4.00	4.12	4.25	4 50	4.00	3.95	
Interest paid and accrued { On debentures	28,443	1,054	2,270						1,169	8,101	
{ On deposits	10,426	11,038	6,325	5,563	11,114	5,166	6,148	13,738	6,957	18,199	
Cost of management	7,287	4,091	2,121	2,099	11,114	2,268	2,105	4,465	2,234	5,319	
Invested and secured by mortgage { In Ontario	1,234,120	585,314	511,495	314,393	732,720	265,853	336,039	549,016	403,518	1,271,561	
{ Elsewhere											
Mortgages by instalments		446,453	462,685	232,393	453,206	197,262					
Mortgages at stated period	1,234,120	138,861	48,810	82,000	279,514	68,591	336,039	549,016	403,518	1,271,561	
Average interest on total amount secured by mortgage	6.56	6.50	6.56	6.25	6.27	6.24	6.25	6.06	6.25	6.25	
Average interest on amount loaned on mortgage in year	6.14	6.33	6.63	6.00	6.07	6.00	6.00	6.00	6.00	6.00	
Mortgages on which compulsory proceedings have been taken { Number	9	6	5	2	7	3	1			4	
{ Amount	16,550	8,420	8,800	8,744	10,715	3,691	402			12,195	
Value of mortgaged property held for sale	53,947	57,335		14,000	13,629		10,000	12,000		17,700	
Amount chargeable against such property	63,791	57,335		13,380	13,629		9,228	23,849		11,945	

TABLE I. LOAN AND INVESTMENT COMPANIES—*Continued.*

Schedule.	British Mortgage, Stratford.	Stratford Building, Stratford.	Bristol and West of England, Toronto.	British Canadian, Toronto.	Building and Loan, Toronto.	Canadian Homestead, Toronto.	Canadian Mutual Loan, Toronto.	Canada Landed and National Investment, Toronto.	Canada Permanent, Toronto.	Canadian Savings, Loan and Building, Toronto.
Capital stock.	$	$	$	$	$	$	$	$	$	$
Capital authorized	5,000,000	Unlimited	2,433,333	5,000,000	750,000	1,000,000	50,000,000	4,000,000	5,000,000	5,000,000
Capital subscribed	450,000	160,000	680,117	1,937,900	750,000	494,950	2,600,000	2,008,000	5,000,000	122,500
Liabilities.										
Liabilities to stockholders :										
Stock fully paid up	159,700	.....	.....	.....	750,000	.....	.....	.....	2,000,000	.....
Stock on which has been paid	151,663	24,347	136,023	386,289	.....	107,847	36,951	1,004,000	600,000	.....
Accumulating stock	.....	.....	.....	.....	.....	.....	88,571	.....	.....	18,540
Reserve fund	67,000	.....	19,467	105,000	112,000	7,692	.....	345,000	1,450,000	.....
Dividends declared and unpaid	10,883	162	.....	11,295	22,500	.....	4,106	38,143	156,052	.....
Contingent fund and unappropriated profits	887	51	9,792	9,540	45,728	12,671	12,041	7,791	122,619	63
Total	390,133	24,560	165,282	512,124	930,228	128,210	141,669	1,394,934	4,328,671	18,603
Liabilities to the public :										
Deposits	533,706	.....	.....	10,215	194,799	3,120	.....	.....	908,265	.....
Debentures payable in Canada	.....	.....	.....	170,176	154,458	.....	.....	213,893	344,496	.....
Debentures payable elsewhere	.....	.....	1,087,950	1,422,376	565,382	.....	.....	2,708,220	*6,342,167	.....
Interest on debentures due and accrued	.....	.....	11,705	17,436	.....	.....	.....	19,090	41,531	.....
Interest on deposits due and accrued	20,411	.....	.....	.....	.....	.....	.....	.....	148,976	.....
Owing to banks	.....	3,705	.....	1,430	.....	.....	.....	.....	.....	.....
Other liabilities	.....	.....	9,050	6,025	971	2,613	.....	17,393	16,021	.....
Total	554,117	3,705	1,108,705	1,627,658	915,610	5,733	.....	2,958,596	7,801,456	.....
Assets.										
Secured loan assets :										
Real estate of—										
General borrowers	923,709	27,575	1,123,134	1,889,469	1,467,213	125,100	132,652	3,895,773	11,095,380	11,991
Directors and executive officers of company	7,962	.....	.....	.....	.....	2,600	2,400	.....	.....	.....
Held under power of sale	9,000	.....	56,337	151,533	.....	.....	.....	283,717	406,568	.....
Shareholders' stock	1,500	80	.....	500	4,656	.....	300	.....	20,660	.....
Directors and officers of company on their stock	700	.....	.....	.....	.....	.....	.....	.....	.....	.....
Otherwise secured	.....	.....	.....	.....	.....	500	.....	22,824	30,508	4,267
Total	942,871	27,655	1,179,471	2,041,502	1,471,869	128,200	135,352	4,202,314	11,553,116	16,258

Property assets:											
Municipal and school section securities, cash value				1,470					192,067		
Office furniture and fixtures		183		446		125					
Cash on hand		296	44	1,841	206			543	2,078	2,060	
Cash in banks	1,379		16,054	79,464	75,479	5,559	4,821	104,733	253,534		
Special deposit in banks					15,000						
Office premises					80,000			40,000	127,233		
Real estate absolutely foreclosed			18,000		183,695						
Real estate otherwise acquired					19,088						
Other property		131	60,418	15,059	501	59	1,496	5,940	2,099	285	
Total	1,379	610	94,516	98,280	373,969	5,743	6,317	151,216	577,011	2,345	
Grand total *assets* or *liabilities*	944,250	28,265	1,273,987	2,139,782	1,845,838	133,943	141,669	4,353,530	12,130,127	18,603	
Miscellaneous.											
Dividends declared in year — Rate per cent.	7.	5. and 6.	6.	7.	6.		†	7.	12.	8.	
Dividends declared in year — Amount	21,670	1,055	8,161	22,590	45,000		16,088	70,280	312,000	1,618	
Loaned during the year	297,729	12,580	110,674	325,844	173,000	16,975		564,863	2,037,994	11,694	
Received from borrowers (principal and interest)	274,240	1,739	199,054	296,335	250,314	7,580	5,800	699,854	2,720,375	‖1,469	
Received from depositors	628,140				369,745	‡41,703			270,957	‖16,625	
Repaid depositors	575,424			665	354,726	‡41,766			277,009	‖4,267	
Debentures issued			45,508	158,377	179,973			698,206	471,092		
Debentures repaid			44,579	65,933	149,685			572,460	453,646		
Debentures to mature within one year			293,922	293,445	110,360			542,712	1,017,273		
Average rate of interest — For debentures			4.23	4.61	4.50			4.35	4.08		
Average rate of interest — For deposits	3.75			4.43	3.51	4.50			3.91	6.00	
Interest paid and accrued — On debentures			46,137	75,472	31,564			128,413	325,844		
Interest paid and accrued — On deposits	20,411				6,563	§2,266			64,221	297	
Cost of management	5,553	216	17,966	14,533	13,971	2,136		32,084	89,073		
Invested and secured by mortgage — In Ontario	940,671	27,575	1,179,471	1,807,622	1,350,415	127,700	66,843	3,287,715	9,576,297	11,991	
Invested and secured by mortgage — Elsewhere				233,380	116,798		68,209	891,775	1,925,651		
Mortgages by instalments		26,575	21,500	861,127	44,510			160,691	10,171,931	11,991	
Mortgages at stated period	940,671	1,000	1,157,971	1,179,875	1,422,703	127,700	135,052	4,018,799	1,330,017		
Average interest on total amount secured by mortgage	6.12	7.00	6.65	6.40	6.62	6.00	10.80	6.72	6.80		
Average interest on amount loaned on mortgage in year	6.12	7.00	6.47	6.60	6.50	6.00	10.80	6.50	6.85		
Mortgages on which compulsory proceedings have been taken — Number		1	2	19	10		9	14	134		
Mortgages on which compulsory proceedings have been taken — Amount		600	3,000	35,915	22,592		8,050	21,575	438,398		
Value of mortgaged property held for sale	9,000		56,337	155,550				283,717	480,275		
Amount chargeable against such property	9,000		56,337	151,533				283,717	406,568		

* Including $916,919 of debenture stock at 4 per cent.
§ And shares withdrawn.
† 15 per cent. on prepaid stock and 26 per cent. on instalment stock.
‖ Members only.
‡ Members only for dues.

TABLE I. LOAN AND INVESTMENT COMPANIES—*Continued.*

Schedule.	City and County Loan, Toronto.	Dominion Building and Loan, Toronto.	Dovercourt Land, Toronto.	Farmers' Loan, Toronto.	Freehold Loan, Toronto.	Home Savings, Toronto.	Imperial Loan, Toronto.	Imperial Trusts, Toronto.	Land Security, Toronto.	London and Canadian, Toronto.
Capital stock.	$	$	$	$	$	$	$	$	$	$
Capital authorized	500,000	10,000,000	500,000	1,057,250	3,800,000	2,000,000	1,000,000	500,000	5,000,000	5,000,000
Capital subscribed	48,700	2,545,600	64,550	1,057,250	3,223,500	1,750,000	839,500	400,000	1,382,300	5,000,000
Liabilities.										
Liabilities to stockholders:										
Stock fully paid up	22,150			500,000	843,000					
Stock on which has been paid	11,549	267,564	63,650	111,430	476,100	175,000	626,350	95,195	550,302	700,000
Accumulating stock							37,613			
Reserve fund			25,000	146,195	659,550	147,000	153,000		550,000	330,000
Dividends declared and unpaid	1,690		2,227	21,400	52,764	6,125	23,003	4,460	27,498	28,000
Contingent fund and unappropriated profits	600	2,369	11,065		60,236	20,968	8,493	1,235	37,979	45,586
Total	35,989	269,933	101,942	779,025	2,091,650	349,093	848,459	100,890	1,165,779	1,133,586
Liabilities to the public:										
Deposits				458,726	803,960	1,787,705	48,251		253,142	
Debentures payable in Canada			500	268,248	640,113		152,100		250,160	1,500
Debentures payable elsewhere				521,074	2,628,399		972,550		772,608	‖3,883,038
Interest on debentures due and accrued			2	17,976	77,475		17,502		6,953	23,054
Interest on deposits due and accrued		*2,929				64,132	3,670		3,956	
Owing to banks		100					8,631			41,163
Other liabilities	296	3,845	10,050			2,500		‡45,473	74,790	16,339
Total	296	6,874	10,552	1,266,024	4,149,947	1,854,337	1,202,704	45,473	1,361,609	3,565,094
Assets.										
Secured loan assets:										
Real estate of—										
General borrowers	24,925	268,743	62,149	1,939,531	5,423,493	944,846	1,965,706	12,500	1,014,913	3,714,173
Directors and executive officers of company	800					24,391				
Held under power of sale				55,625	329,665	4,011	68,000		48,054	229,134
Shareholders' stock		500		4,109	22,585	4,184	4,228			
Directors and officers of company on their stock						3,902				
Otherwise secured						††1,095,220			253,424	117,884
Total	25,725	269,243	62,149	1,999,265	5,775,743	2,076,554	2,037,934	12,500	1,316,391	4,061,191

Property assets :											
Municipal and school section securities, cash value						1,420	43,861				376,247
Office furniture and fixtures		66	1,330		267	1,715	1,000		1,032		
Cash on hand		393	19	877	2,710	264	2,390	11,381			
Cash in banks		1,401	3,471	3 738	41,006	212,808	55,345	1,848	1,715	38,517	25,950
Special deposit in banks											
Office premises		8,700				247,607	24,280				120,000
Real estate absolutely foreclosed										21,322	
Real estate otherwise acquired				31,710						1,151,158	105,636
Other property			2,744	14,020	1,801	2,040			‡‡131,116		9,656
Total		10,560	7,564	50,345	45,784	465,854	126,876	13,229	133,863	1,210,997	637,489
Grand total *assets* or *liabilities*		36,285	276,807	112,494	2,045,049	6,241,597	2,203,430	2,051,163	146,363	2,527,388	4,398,680
Miscellaneous.											
Dividends declared in year	Rate per cent	6.		7.	7.	8.	7.	7.	5.	10.	8.
	Amount	1,666		4,456	42,800	105,528	12,250	45,511	4,460	54,944	56,000
Loaned during the year		11,715			374,527	1,017,265	2,231,208	629,006	5,000	522.302	562,348
Received from borrowers (principal and interest)		10,788			375,609	1,346,126	2,197,859	576,146	1,141	319,600	503,483
Received from depositors			†206,162		332,831	543,481	2,853,474	244,080	§32,009	183,562	
Repaid depositors			† 47,307		319,272	514,212	2,759,337	242,494	§23,452	124,983	
Debentures issued					127,767	713,861		133,693		707,654	299,617
Debentures repaid				1,500	43,607	680,107		174,004		332,935	568,046
Debentures to mature within one year				500	87,785	620,316		134,782		81,600	553,190
Average rate of interest	For debentures			5.00	4.75	4.46		4.60		4.66	4.14
	For deposits				4.00	3.93	4.00	4.25	4.50	4.55	
Interest paid and accrued	On debentures			102	34,661	136,604		52,130		30,271	142,891
	On deposits				20,822	31,659	66,887	3,670	573	12,147	
Cost of management		653		1,833	10,575	49,133	16,049	19,873	5,676	18,423	37,269
Invested and secured by mortgage	In Ontario	25,725	268,743	62,149	1,979,416	4,631,673	973,248	1,333,706	12,500	1,067,610	3,943,307
	Elsewhere				15,740	1,121,485		700,000			
Mortgages by instalments		6,714	268,743			925,300	265,392	200,607		301,897	
Mortgages at stated period		19,011		62,149	1,995,156	4,827,858	707,856	1,833,099	12,500	765,713	3,943,307
Average interest on total amount secured by mortgage		7.00		7.00	6.25	6 58	6.00	6.75	8.00	6.55	6.40
Average interest on amount loaned on mortgage in year		7.00		7.00	6.50	7.10	6.00	6.75	8.00	6.55	6.50
Mortgages on which compulsory proceedings have been taken	Number	1	3		22	59	2	20		6	46
	Amount	2,200	4,400		22,632	106,028	6,320	110,775		37,600	88,360
Value of mortgaged property held for sale					70,000	320,863	5,566	68,000		54,172	129,134
Amount chargeable against such property					55,625	329 665	4,011	68,000		48,054	129,134

* On stock. † From members only. †† On the collateral security of bonds, stocks and debentures. ‡ Including $43,906 Trust Account. ‡‡Including $125,985 Loan Company debentures and trust investments. ‖ Including certificates payable at fixed dates. § Trust accounts.

TABLE I. LOAN AND INVESTMENT COMPANIES—*Continued*

Schedule.	London and Ontario, Toronto.	North British Canadian, Toronto.	North of Scotland, Toronto.	Ontario Industrial, Toronto.	Peoples' Loan, Toronto.	Real Estate Loan, Toronto.	Scottish Ontario and Manitoba, Toronto.	Sons of England Building, Toronto.	Toronto General Trusts, Toronto.
Capital Stock.	$	$	$	$	$	$	$	$	$
Capital authorized	3,000,000	2,433,333	3,650,000	500,000	600,000	1,600,000	2,433,333	1,000,000	1,000,000
Capital subscribed	2,750,000	2,433,333	3,650,000	466,800	600,000	578,840	1,216,667	38,400	1,000,000
Liabilities.									
Liabilities to stockholders:									
Stock fully paid up	.....	.....	.....	58,000	600,000	322,440	.....	2,600	.....
Stock on which has been paid	550,000	486,667	730,000	256,337	.....	51,280	608,333	5,227	200,000
Accumulating stock	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reserve fund	155,000	92,467	330,933	190,000	112,000	45,000	26,767	.....	225,000
Dividends declared and unpaid	18,587	18,068	36,500	11,002	21,000	7,522	122	.....	9,911
Contingent fund and unappropriated profits	.....	‡37,913	7,693	8,585	4,232	12,974	*244,357	247	29,825
Total	723,587	635,115	1,105,126	523,924	737,232	439,216	879,579	8,074	464,736
Liabilities to the public:									
Deposits	.....	8,743	.....	71,617	426,411	366	12,702	.....	.....
Debentures payable in Canada	418,973	.....	.....	.....	170,360	.....	.....	.....	.....
Debentures payable elsewhere	1,866,228	‖1,916,299	*x* 2,913,367	.....	55,237	.....	308,504	.....	.....
Interest on debentnres due and accrued	18,786	12,318	.....	.....	3,195	.....	2,244	.....	.....
Interest on deposits due and accrued	.....	.....	.....	1,748	.....	.....	.....	.....	.....
Owing to banks	.....	.....	.....	.....	.....	.....	.....	.....	16,193
Other liabilities	2,199	16,434	5,568	188,030	657	.....	9,659	.....	††4,322,208
Total	2,306,186	1,953,794	2,918,935	261,395	655,860	366	333,109	.....	4,338,401
Assets.									
Secured loan assets:									
Real estate of—									
General borrowers	2,783,446	2,303,854	3,630,594	185,011	1,156,520	291,027	177,638	6,800	3,991,162
Directors and executive officers of company	.....	.....	.....	17,773	.....	.....	.....	.....	.....
Held under power of sale	80,304	131,700	16,840	.....	167,728	.....	54,757	.....	72,157
Shareholders' stock	.....	.....	.....	5,278	6,141	136	.....	.....	.....
Directors and officers of company on their stock	.....	.....	.....	.....	.....	.....	.....	.....	.....
Otherwise secured	12,000	.....	239,513	.....	149	.....	.....	.....	108,492
Total	2,875,750	2,435,054	3,886,947	208,062	1,330,538	291,163	232,395	6,800	4,171,811

Property assets:										
Municipal and school section securities, cash value		69,659	10,171							
Office furniture and fixtures		2,025	243	1,387	421	450	150	203		737
Cash on hand		76	1,058	116	200	3,691		503		71
Cash in banks		81,317	1,585	30,568	414	38,843	3,316	4,361	1,274	409,365
Special deposit in banks			43,800							
Office premises				105,043						130,000
Real estate absolutely foreclosed			56,169				91,659			
Real estate otherwise acquired					571,222	19,570	9,704	956,467		
Other property		946	40,829		5,000		43,590	18,759		91,153
Total		154,023	153,855	137,114	577,257	62,554	148,419	980,293	1,274	631,326
Grand total *assets* or *liabilities*		3,029,773	2,588,909	4,024,061	785,319	1,393,092	439,582	1,212,688	8,074	4,803,137
Miscellaneous.										
Dividends declared in year	Rate per cent	7.	6.	10.	7.	7.	4.		†6.	10.
	Amount	36,087	29,200	73,000	22,003	42,000	14,946		431	17,397
Loaned during the year		319,470	596,456	475,187	22,338	208,641	121,043		400	1,165,321
Received from borrowers (principal and interest)		406,126	604,805	477,124	49,094	228,130	85,942		462	662,237
Received from depositors			5,011		49,374	613,364		11,730		
Repaid depositors			21,298		49,112	632,552		11,000		
Debentures issued		107,138	198,837	*y* 833,605		88,597		7,300		
Debentures repaid		112,193	143,938	*y* 720,646		48,000		28,470		
Debentures to mature within one year		466,372	226,899	589,840		33,100		106,015		
Average rate of interest	For debentures	4.48	4.30	4.00		5.05		4.50		
	For deposits		4.50		5.00	4 48		4.50		
Interest paid and accrued	On debentures	101,415	91,112	114,190		10,146		15,909		
	On deposits		345		3,513	19,131		555		
Cost of management		27,351	22,233	50,160	4,956	8,406	4,889	5,229	78	36,966
Invested and secured by mortgage	In Ontario	2,863,750	1,195,896	3,647,434	202,784	1,324,248	80,006	87,944	6,800	‡‡ 4,145,268
	Elsewhere		1,239,158				211,021	144,451		
Mortgages by instalments			1,660			15,830			6,800	
Mortgages at stated period		2,863,750	2,433,394	3,647,434	202,784	1,308,418	291,027	232,395		4,145,268
Average interest on total amount secured by mortgage		6.66	6.75	6.78	6.25	6 17	6.50	6.50	6 33	6.00
Average interest on amount loaned on mortgage in year		6.60	6.75	6.50	6.25	6.38	6.50	6.50	7.00	5.87
Mortgages on which compulsory proceedings have been taken	Number	17	14	34		22		8		
	Amount	48,772	20,020	47,277		119,104		17,168		
Value of mortgaged property held for sale		79,925	111,981	17,000		192,750		54,757		58,650
Amount chargeable against such property		80,304	131,700	16,840		167,728		54,757		72 157

‡ Including $12,288 in anticipation on calls. | Including $419,341 debenture stock. | ∝ Including $499,943 perpetual debenture stock.
* Including $240,507 paid in anticipation of calls. | *y* Including debenture holders and for certificates. | † Six per cent on three years.
†† Including $1,923,411 for High Court of Justice, and $2,398,787 for trusts and agencies. | ‡‡ Including $81,948 lunatics estates,

TABLE I. LOAN AND INVESTMENT COMPANIES.—*Concluded.*

Schedule.	Toronto Land and Loan, Toronto.	Toronto Savings and Loan, Toronto.	Trust and Loan, Toronto.	Union Loan, Toronto.	Western Canada Loan, Toronto.	York County Loan, Toronto.	Oxford Permanent Loan, Woodstock.	Grand totals.
Capital Stock.	$	$	$	$	$	$	$	$
Capital authorized	1,000,000	2,000,000	14,600,000	1,000,000	3,000,000	10,000,000	270,000	187,402,249
Capital subscribed	104,600	500,000	7,300,000	1,000,000	3,000,000	250,000	243,300	80,278,277
Liabilities.								
Liabilities to stockholders:								
Stock fully paid up		500,000		599,680	1,000,000	1,782	231,900	14,449,595
Stock on which has been paid	76,447		1,581,667	79,880	500,000		2,166	18,729,198
Accumulating stock						2,335		260,523
Reserve fund	1,015	80,000	827,439	255,000	770,000		20,500	10,300,489
Dividends declared and unpaid		12,500		26,963	75,000		7,765	960,827
Contingent fund and unappropriated profits	8,792	3,768	90,325	18,349	77,374	507	6,819	1,193,110
Total	86,254	596,268	2,499,431	979,872	2,422,374	4,624	269,150	45,893,742
Liabilities to the public:								
Deposits	1,337	280,850		423,881	920,580		105,471	19,120,523
Debentures payable in Canada		437,400		129,067	431,569			8,598,440
Debentures payable elsewhere			4,813,379	1,126,838	3,107,564			43,940,267
Interest on debentures due and accrued		9,910			21,065			438,802
Interest on deposits due and accrued		1,967						301,922
Owing to banks	750				4,339			143,389
Other liabilities	54,232	419	110,738		1,610		338	5,184,085
Total	56,319	730,546	4,924,117	1,679,786	4,486,727		105,809	77,727,428
Assets.								
Secured loan assets:								
Real estate of—								
General borrowers	54,417	421,755	5,981,622	2,323,904	6,445,194		286,848	101,976,599
Directors and executive officers of company								176,476
Held under power of sale			67,658	127,033	331,952		8,140	3,609,708
Shareholders' stock				9,813	5,625	200	12,880	553,604
Directors and officers of company on their stock				2,500				111,842
Otherwise secured		79,500	52,804			3,450	20,778	2,823,350
Total	54,417	501,255	6,102,084	2,463,250	6,782,771	3,650	328,646	109,251,079

Property assets:								
Municipal and school section securities, cash value				5,021	10,385			1,142,979
Office furniture and fixtures			874	1,239	2,467	230	275	30,472
Cash on hand		3,168	1,012	143			6	93,522
Cash in banks	907	14,550	43,462	76,724		744	36,961	2,528,627
Special deposit in banks			323,167	50,000				1,252,109
Office premises			83,211	63,043	113,478		7,762	1,480,031
Real estate absolutely foreclosed	3,578		105,231					708,199
Real estate otherwise acquired	83,416	66,252						3,105,721
Other property	255	††741,589	§764,507	238			1,309	4,028,431
Total	88,156	825,559	1,321,464	196,408	126,330	974	46,313	14,370,091
Grand total *assets* or *liabilities*	142,573	1,326,814	7,423,548	2,659,658	6,909,101	4,624	374,959	123,621,170
Miscellaneous.								
Dividends declared in year — Rate per cent.	3.	6.	7.	8.	10.		6½.	7.05.
Dividends declared in year — Amount	2,291	24,500	110,717	53,811	152,175		15,213	2,356,348
Loaned during the year	1,340	492,163	690,864	396,360	1,135,999	3,083	34,585	23,403,612
Received from borrowers (principal and interest)	20,035	29,7	978,636	420,140	1,244,594		64,863	24,350,995
Received from depositors	1,566	456,2,5		330,444	395,142		90,002	24,321,138
Repaid depositors	3,272	205,725		329,994	631,073		87,285	23,299,876
Debentures issued		159,100	642,123	290,706	490,937			10,372,155
Debentures repaid		51,200	578,899	135,787	260,791			6,798,834
Debentures to mature within one year		86,100	763,913	192,995	796,015			9,722,875
Average rate of interest — For debentures		4.75	4.01	4.25	4.06			
Average rate of interest — For deposits	5.00	4.25		4.00	3.96		4.00	
Interest paid and accrued — On debentures		22,501	224,795	53,888	141,438			2,273,183
Interest paid and accrued — On deposits	125	3,005		15,271	42,952		4,271	794,784
Cost of management	1,650	8,260	62,195	15,500	53,285	462	1,966	920,383
Invested and secured by mortgage — In Ontario	54,417	421,755	2,717,549	2,450,937	4,660,599		294,988	} 105,849,375
Invested and secured by mortgage — Elsewhere			3,331,731		2,116,547			
Mortgages by instalments				800,000	6,777,146		13,417	30,239,197
Mortgages at stated period	54,417	421,755	6,049,280	1,650,937			281,571	75,610,178
Average interest on total amount secured by mortgage	7.00	5.75	6.64	6.50	7.00		6.75	
Average interest on amount loaned on mortgage in year	7.00	5.50	6.54	6.25	7.00		6.00	
Mortgages on which compulsory proceedings have been taken — Number	4		117	16	66			884
Mortgages on which compulsory proceedings have been taken — Amount	7,312		142,763	29,580	290,371			2,161,496
Value of mortgaged property held for sale			60,460	127,033	365,157		8,200	3,718,669
Amount chargeable against such property			67,658	127,033	331,952		8,140	3,609,708

†† Including $737,785, Banks, Loan, Insurance, Trust Companies and Street Railway Securities.

§ Dominion securities, consuls and bonds.

LOAN AND INVESTMENT COMPANIES.

TABLE II.—Smmmary statement showing totals of all companies reporting for the six years 1887-92.

Schedule for Loan Companies.	1892	1891	1890	1889	1888	1887
Number of companies reported	76	71	67	71	64	55
Capital Stock.	$	$	$	$	$	$
Capital authorized	187,402,249	164,837,249	102,782,249	99,824,249	96,246,249	79,575,583
Capital subscribed	80,278,277	76,152,817	70,672,710	69,694,221	67,939,559	56,114,310
Liabilities.						
Liabilities to stockholders:						
Stock fully paid up	14,449,595	13,727,930	12,498,330	12,149,509	11,617,271	11,342,861
Stock on which has been paid	18,729,198	18,608,795	18,688,567	18,569,883	18,470,826	15,429,167
Accumulating stock	260,523	100,688	99,836	107,935	205,839	222,602
Reserve fund	10,300,489	9,866,475	9,288,795	8,711,107	8,030,118	7,254,105
Dividends declared and unpaid	960,827	940,995	952,907	985,602	955,644	885,726
Contingent fund and unappropriated profits	1,193,110	1,134,514	1,145,117	1,105,951	828,463	776,092
Total	45,893,742	44,379,397	42,673,552	41,629,987	40,108,161	35,910,563
Liabilities to the public:						
Deposits	19,120,523	18,176,765	17,103,403	16,942,965	16,560,766	17,533,473
Debentures payable in Canada	8,598,440	7,910,676	7,654,504	7,622,256	6,578,122	5,500,622
Debentures payable elsewhere	43,940,267	41,023,249	38,435,990	36,712,825	34,857,050	26,722,070
Interest on debentures due and accrued	438,802	433,954	397,599	683,322	619,070	587,484
Interest on deposits due and accrued	301,922	283,310	296,817			
Owing to banks	143,389	91,480	269,094	214,046	131,903	155,326
Other liabilities	5,184,085	4,837,715	1,386,762	791,742	793,264	678,189
Total	77,727,428	72,757,149	65,544,199	62,967,156	59,540,175	51,177,104
Assets.						
Secured loan assets:						
Real estate of—						
General borrowers	101,976,599	97,780,207	92,001,824	91,536,309	85,578,993	74,954,076
Held under power of sale	3,609,708	3,381,150	3,006,109			
Directors and executive officers of company	176,476	94,158	182,724	207,965	169,777	252,957

Shareholders' stock	553,604	521,659	609,797	602,587	708,137	852,267
Directors and officers of company on their stock	111,342	158,507	147,110	149,375	126,482	177,465
Otherwise secured	2,823,350	2,429,344	2,163,468	2,170,651	2,458,801	2,799,039
Total	109,251,079	104,365,025	98,111,032	94,666,887	89,042,190	79,035,804
Property assets :						
Municipal and school section securities, cash value	1,142,979	1,072,558	892,101	936,271	1,159,113	1,153,165
Office furniture and fixtures	30,472	24,690	24,424	27,182	30,385	27,372
Cash on hand	93,522	109,684	101,785	101,376	63,768	74,053
Cash in banks	2,528,627	2,637,761	2,002,822	2,501,983	2,316,875	2,127,308
Special deposits in banks	1,252,109	1,344,903	640,697			
Office premises	1,480,031	1,270,095	1,028,296	1,001,508	869,650	751,971
Real estate absolutely foreclosed	708,199	760,200	900,612	1,095.197		
Real estate otherwise acquired	3,105,721	3,465,404	2,589,190	2,283,817	6,166,355	3,917,994
Other property	4,028,431	2,086,226	1,926,792	1,982,922		
Total	14,370,091	12,771,521	10,106,719	9,930,256	10,606,146	8,051,863
Grand total *assets* or *liabilities*	123,621,170	117,136,546	108,217,751	104,597,143	99,648,336	87,087,667
Miscellaneous.						
Dividends declared in year—Rate per cent	7.05	7.12	7.21	7.06	7.28	7.55
Dividends declared in year—Amount	2,356,348	2,309,701	2,250,027	2,202,217	2,152,377	2,021,207
Loaned during the year	23,403,612	19,124,870	18,542,000	21,795,945	18,567,954	17,162,412
Received from borrowers (principal and interest)	24,350,993	22,096,610	20,469,955	21,353,871	20,393,404	18,987,927
Received from depositors	24,321,138	23,968,569	23,347,971	24,734,347	23,001,584	25,283,071
Repaid depositors	23,299,876	23,224,399	23,416,074	24,583,550	24,261,630	25,283,441
Debentures issued	10,372,155	9,400,632	10,564,009	11,337,938	8,736,777	6,263,884
Debentures repaid	6,798,834	6,783,889	8,523,124	7,578,661	5,944,268	4,346,294
Debentures to mature within one year	9,722,875	8,236,001	7,856,937	10,230,949	10,527,983	5,777,979
Interest paid and accrued—On debentures	2,273,183	2,147,903	2,035,921	2,015,084	1,906,741	1,552,621
Interest paid and accrued—On deposits	794,784	743,903	710,285	680,570	710,636	685,138
Cost of management	920,383	877,141	846,950	843,390	838,906	685,905
Invested and secured by mortgage	105,849,375	101,373,476	95,245,657	91,574,215	86,728,523	75,494,963
Mortgages by instalments	30,239,197	29,388,316	28,285,503	29,233,503	32,337,689	30,001,162
Mortgages at stated period	75,610,178	71,985,160	66,960,154	62,340,712	54,390,834	45,493,801
Mortgages on which compulsory proceedings have been taken—Number	884	892	805	767	820	68
Mortgages on which compulsory proceedings have been taken—Amount	2,161,496	2,081,354	1,899,209	1,850,647	1,834,890	1,419,01
Value of mortgaged property held for sale	3,718,669	3,564,646	3,199,209	3,026,619	3,196,160	2,491,78
Amount chargeable against such property	3,609,708	3,451,812	3,006,109	2,860,394	2,969,480	2,190,465

LOAN AND INVESTMENT COMPANIES.

TABLE III. Showing comparative statistics of 54 companies reporting for the six years, 1887-92.

Schedule for Loan Companies.	1892	1891	1890	1889	1888	1887
	$	$	$	$	$	$
*Capital subscribed	60,698,527	60,381,017	61,280,660	60,331,132	57,335,159	56,048,310
**Liabilities.*						
Liabilities to Stockholders:						
Stock paid in and accumulating stock	29,043,589	28,939,751	28,871,418	28,468,476	27,511,217	26,932,431
Reserve fund	9,577,011	9,230,931	8,927,162	8,369,624	7,666,384	7,241,765
Dividends declared and unpaid	873,259	867,292	893,632	929,638	899,906	885,736
Contingent fund and unappropriated profits	823,735	796,109	832,667	801,055	773,730	774,500
Total	40,317,594	39,834,083	39,524,879	38,568,793	36,851,237	35,834,432
Liabilities to the public:						
Deposits	18,200,849	17,658,123	16,893,287	16,823,175	16,519,063	17,533,413
Debentures payable in Canada	7,414,938	6,873,944	7,047,214	7,089,355	5,949,676	5,500,622
Debentures payable elsewhere	38,426,860	35,736,764	33,291,108	31,601,564	29,078,893	26,722,070
Interest on debentures and deposits due and accrued	664,030	656,673	648,231	638,689	570,858	587,484
Owing to banks	109,386	62,290	217,175	171,320	114,852	155,326
Other liabilities	765,955	1,165,976	1,355,309	749,789	714,753	678,189
Total	65,582,018	62,153,770	59,452,324	57,073,892	52,948,095	51,177,104
Assets.						
Secured Loan assets:						
Real estate of—						
General borrowers	91,245,604	88,909,392	87,164,087	84,046,586	77,786,343	74,907,069
Directors and executive officers of company	128,876	59,158	158,724	188,565	164,977	252,957
Shareholders, directors and officers of company on their stock	650,638	668,951	755,307	748,632	829,150	1,028,519
Otherwise secured	2,593,767	2,399,999	2,141,204	2,125,691	2,413,756	2,799,039
Total	94,618,885	92,037,500	90,219,322	87,109,474	81,194,226	78,987,584

Property assets:						
Municipal and school section securities, cash value	1,061,679	1,003,388	820,251	857,174	1,078,462	1,061,151
Office premises, furniture and fixtures	1,363,402	1,159,643	1,049,333	1,025,157	896,501	779,343
Cash on hand and in banks	3,159,466	3,554,344	2,585,755	2,399,847	2,102,288	2,189,670
Real estate absolutely foreclosed or otherwise acquired	2,715,416	2,674,349	2,493,194	2,468,151	2,528,241	2,203,676
Other property	2,980,764	1,558,629	1,809,348	1,782,882	1,999,614	1,790,112
Total	11,280,727	9,950,353	8,757,881	8,533,211	8,605,106	8,023,952
Grand total *assets* or *liabilities*	105,899,612	101,987,853	98,977,203	95,642,685	89,799,332	87,011,536
Miscellaneous.						
Dividends declared in year	2,154,317	2,144,548	2,138,647	2,097,321	2,032,336	2,017,476
Loaned during the year	19,768,025	16,797,699	17,263,028	20,39 ,348	17,048,536	17,160,053
Received from borrowers (principal and interest)	22,019,702	19,943,157	19,114,906	19,941,262	18,820,162	18,987,927
Received from depositors	22,480,118	22,977,548	22,856,709	24,419,674	22,918,698	25,283,071
Repaid depositors	22,039 489	22,372,205	23,028,209	24,357.831	24,188,350	25,283,441
Debentures issued	9,636.989	8,554,899	9,908,610	10,505,870	7,958.544	6,263,884
Debentures repaid	6,392,400	6,266,158	7,974,017	6,868,817	5,123,871	4,346,294
Debentures to mature within one year	8,517,144	7,463,630	6,966,372	9,080,986	9,033,705	5,777,979
Interest paid and accrued — On debentures	1,962,292	1,860,951	1,764,534	1,741,483	1,592,484	1,552,621
Interest paid and accrued — On deposits	767,132	725,271	702,140	676,871	708,708	685,138
Cost of management	786,702	757,619	767,158	765,390	748,327	684,966
Mortgages on which compulsory proceedings have been taken — Number	795	845	738	716	735	688
Mortgages on which compulsory proceedings have been taken — Amount	2,007,059	1,956,779	1,779,796	1,746,794	1,670,733	1,419,012
Value of mortgaged property held for sale	3,248,006	3,059,736	2,799,362	2,611,812	2,719,277	2,475,568
Amount chargeable against such property	3,110,744	2,959,009	2,606,651	2,446,634	2,493,399	2,174,245

* This does not include in 1892 the figures for the Royal Standard Loan Company of London, which sold its assets during the year to the London Loan Company.

LOAN AND INVESTMENT COMPANIES.

TABLE IV. Comparative statement showing the amount loaned in each of the five years 1888-92, with a yearly average for the six years 1887-92, by the 54 companies that have reported for the full period.

Companies.	1892	1891	1890	1889	1888	Average 1887-92.
Toronto:	$	$	$	$	$	$
Bristol and West of England	110,674	114,406	238,143	234,073	229,431	197,488
Building and Loan	173,000	153,826	285,400	331,079	289,973	249,451
Canada Landed Credit	564,863	681,800	211,297	252,550	237,547	558,406
National Investment Association			218,440	316,076	299,236	
Canada Permanent Loan	2,037,994	1,612,056	2,115,055	2,276,984	2,122,103	1,930,044
*Dovercourt Land and Building	.....	.....	.....	.....	.....	.....
Farmers' Loan	374,527	309,709	440,425	391,567	308,119	365,435
Freehold Loan	1,017,265	866,559	1,122,186	1,459,559	823,144	1,096,292
Home Savings	2,231,208	1,935,977	1,464,299	1,586,866	1,387,119	1,638,029
Imperial Loan	629,006	526,498	351,599	453,068	469,764	515,226
Land Security	522,302	238,483	290,735	619,854	476,965	417,065
London and Canadian Loan	662,348	495,126	627,732	608,605	605,581	629,029
North of Scotland Mortgage	475,187	476,000	456,892	841,811	486,653	536,291
Ontario Industrial Loan	22,338	36,142	59,575	174,431	108,974	79,568
People's Loan	208,641	145,446	161,824	297,205	242,067	217,302
Real Estate Loan	121,043	75,800	170,748	72,894	20,504	78,079
Toronto Land and Loan	1,340	3,022	15,259	64,695	9,528	22,658
Trust and Loan	690,864	809,438	1,080,875	776,601	917,430	819,532
Union Loan	396,360	449,661	530,242	672,855	435,998	485,748
Western Canada Loan	1,135,999	900,052	1,105,056	1,224,811	1,303,682	1,129,156
London:						
Agricultural Savings	362,482	179,060	133,798	301,479	216,853	249,538
Canadian Savings	212,802	248,478	185,487	242,036	190,843	230,011
Dominion Savings	720,222	847,696	990,823	276,468	391,896	659,720
Empire Loan			68,369	69,694	53,844	
Huron and Erie Loan	1,022,274	706,605	737,013	937,176	736,594	780,062
London Loan	1,026,789	506,713	200,470	290,526	200,805	453,795
Royal Standard Loan		86,940	44,472	52,106	23,670	
†Ontario Investment Association	8,375	3,493	5,002	6,099	42,496	79,635
Ontario Loan	702,284	645,023	458,585	588,325	619,880	605,413
St. Thomas:						
Elgin Loan	42,954	37,400	30,124	123,682	19,701	53,691
Southern Loan	133,768	93,859	42,942	101,977	83,532	91,690
Southwestern Farmers' Loan	83,186	35,337	15,957	56,219	36,767	46,017
Star Loan	83,916	54,967	65,314	46,299	44,924	60,161
Hamilton:						
Hamilton Provident and Lo	740,239	747,150	621,370	624,245	751,309	716,742
Hamilton Homestead Loan	19,294	17,364	14,814	10,718	17,032	17,134
Landed Banking and Loan	390,296	385,308	258,147	371,083	341,688	345,168
Kingston:						
Frontenac Loan	117,874	147,916	52,039	70,080	70,772	85,793
Ontario Building	85,317	90,639	31,703	64,173	135,367	90,888
Barnia:						
Huron and Lambton Loan	117,638	80,352	142,677	156,072	94,386	120,464
Lambton Loan	208,541	133,649	203,750	213,918	212,760	206,394
Other places:						
Hastings Loan — Belleville	38,254	96,396	72,004	26,140	40,571	57,446
Royal Loan — Brantford	288,399	155,242	154,666	203,467	214,873	202,881
Chatham Loan — Chatham	117,820	90,957	48,743	94,627	47,544	78,991
Huron and Bruce — Goderich	33,074	29,143	46,415	29,854	34,024	38,261
Guelph and Ontario — Guelph	269,422	356,906	248,962	287,584	316,010	302,656
Orangeville Building — Orangeville	2,700	4,867	2,388	93	6,477	2,872
Ontario Loan — Oshawa	90,350	71,147	98,561	102,045	88,895	94,253
Metropolitan Loan — Ottawa	50,182	39,363	50,408	47,061	57,777	46,526
Central Canada — Peterborough	676,409	500,840	741,276	1,684,371	713,401	772,283
Crown Savings — Petrolea	40,664	29,753	47,565	51,606	24,231	35,304
Midland Loan — Port Hope	221,724	223,738	180,519	202,514	153,444	192,255
Security Loan — St. Catharines	153,503	115,396	135,937	134,761	149,603	146,679
British Mortgage — Stratford	297,729	186,127	157,449	223,988	127,811	207,766
Oxford Permanent — Woodstock	34,585	19,874	29,497	45,278	14,938	36,160
Total for 54 companies	19,768,025	16,797,699	17,263,028	20,391,348	17,048,536	18,071,448

* No loans stated in returns, but mortgages are given for balances due on lands purchased.
† In liquidation.

PART V.

CHATTEL MORTGAGES.

The following report deals with chattel mortgages in Ontario for the year 1892 It has been compiled from returns made to the Department of Agriculture in accordance with section 7, chapter 12, Victoria 53.

The following statement gives the number of chattel mortgages on record and undischarged for the province for the year ending December 31, 1892 and the three preceding years :

Year ending Dec. 31.	To secure existing debt or present advance.		To secure future indorsation or advance.		Total.	
	No.	Amount.	No.	Amount.	No.	Amount.
		$		$		$
1892.....	18,927	9,215,753	455	829,724	19,382	10,045,477
1891.....	18,902	8,595,417	516	908,971	19,418	9,504,388
1890.....	17,271	8,121,316	632	857,542	17,903	8,978,858
1889	15,629	6,973,837	585	518,071	16,214	7,491,908

The following statement gives the numbers and amounts of chattel mortgages for the different districts for 1892, and also for the three preceding years :

Districts.	1892		1891		1890		1889	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
		$		$		$		$
Lake Erie.....	2,922	1,132,113	2,790	980,671	2,625	936,817	2,087	696,471
Lake Huron.....	1,847	630,015	1,993	657,862	1,872	618,978	1,503	414,642
Georgian Bay.....	2,120	936,409	2,006	723,291	1,919	694,746	1,932	569,414
West Midland.....	2,685	1,171,407	2,800	1,293,456	2,463	1,201,424	2,324	1,095,364
Lake Ontario.....	4,604	2,950,259	4,479	2,552,273	4,306	2,280,734	4,084	2,539,027
St. Lawrence & Ottawa	2,847	1,505,524	2,900	1,379,862	2,475	1,067,231	2,218	1,120,099
East Midland.....	1,526	607,160	1,619	610,665	1,576	752,620	1,470	679,519
Northern Districts	831	1,112,590	831	1,306,308	667	1,426,308	596	377,372
The Province.....	19,382	10,045,477	19,418	9,504,388	17,903	8,978,858	16,214	7,491,908

The following statement gives the numbers and amounts of chattel mortgages given by farmers for the year 1892 and the three preceding years, arranged by districts :

Districts.	1892		1891		1890		1889	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
		$		$		$		$
Lake Erie.....	1,898	438,480	1,788	400,273	1,674	443,172	1,108	261,788
Lake Huron.....	1,208	322,432	1,354	326,030	1,429	397,627	1,097	269,245
Georgian Bay.....	1,603	456,699	1,570	395,805	1,481	357,255	1,474	283,348
West Midland.....	1,376	468,034	1,362	477,591	1,434	528,131	1,250	464,283
Lake Ontario.....	1,743	662,189	1,776	708,373	1,666	729,368	1,564	732,676
St. Lawrence & Ottawa	1,426	371,659	1,513	384,306	1,376	352,903	1,090	273,182
East Midland.....	1,040	320,573	1,107	320,606	1,123	355,005	992	313,196
Northern Districts.....	480	77,961	519	84,617	378	59,836	302	49,840
The Province.....	10,774	3,117,977	10,989	3,097,601	10,561	3,223,297	8,877	2,647,558

CHATTEL MORTGAGES—BY COUNTY DIVISIONS.

TABLE I. Showing by County Municipalities of Ontario the total number and amount of Chattel Mortgages and Renewals on record and undischarged on January 1 and December 31, 1892.

Counties or Districts.	Chattel mortgages on record January 1st, 1892.				Chattel mortgages on record December 31, 1892.			
	To secure existing debt.		For future indorsation.		To secure existing debt.		For future indorsation.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
		$		$		$		$
*Algoma and Nipissing	413	516,140	11	420,473	418	546,051	11	191,072
Brant	443	180.767	2	402	430	188,718	5	1,813
Bruce	847	289,576	13	2,052	936	278,462	9	900
Carleton	627	426,144	11	14,643	615	387,286	11	10,127
Dufferin	246	73,130	13	6,157	329	96,978	....	....
Elgin	399	145,871	28	8,147	478	179,241	3	52,155
Essex	501	196,985	40	18,510	527	163,560	52	31,946
Frontenac	420	154,003	....	....	444	170,422	....	....
Grey	1220	329,982	....	....	1,208	518,482	5	2,337
Haldimand	222	50,051	1	310	219	55,470	....	....
Haliburton	84	12,492	....	....	74	13,030	....	....
Halton	166	62,448	2	1,518	117	78,422	....	....
Hastings	835	259,215	40	19,801	771	251,546	22	14,322
Huron	541	173,191	32	16,374	450	181,038	7	2,021
Kent	956	285,074	38	8,842	1,070	333,037	5	75,500
Lambton	497	145,225	63	31,444	387	150,492	58	17,102
Lanark	201	104,417	11	8,984	219	118,897	10	3,566
Leeds and Grenville	414	152,248	....	....	432	161,746	10	4,655
Lennox and Addington	210	91,719	7	4,752	203	85,411	7	1,920
Lincoln	257	124,417	20	17,697	261	128,726	12	18,749
Middlesex	760	302,517	6	6,206	725	264,508	10	2,829
Muskoka and Parry Sound	396	260,719	11	108,976	393	294,117	9	81,350
Norfolk	268	78,301	....	....	299	84,644	....	....
Northumberland and Durham	740	369,444	6	5,071	787	317,082	....	....
Ontario	459	209,745	27	12,412	447	244,350	32	12,677
Oxford	323	141,638	3	14,342	241	116,116	16	47,474
Peel	171	115,554	....	....	183	77,848	....	....
Perth	280	167,172	16	6,542	269	129,850	14	5,301
Peterborough	292	150,998	17	6,404	283	118,168	38	47,144
Prescott and Russell	258	107,009	1	150	223	320,065	....	....
Prince Edward	234	71,774	17	7,490	208	60,082	8	3,054
Renfrew	298	71,375	11	17,650	260	66,788	7	4,193
Simcoe	786	293,309	....	....	907	415,590	....	....
Stormont, Dundas and Glengarry	423	205,187	8	21,581	381	145,084	25	25,364
Victoria	350	157,755	1	4,000	322	149,624	16	13,326
Waterloo	169	112,010	12	40,108	171	92,800	3	2,800
Welland	326	173,539	11	15,041	261	143,184	8	13,376
Wellington	509	214,970	18	28,095	453	214,696	19	7,524
Wentworth	523	320,016	13	24.037	544	320,422	16	18,177
York	1,838	1,199,890	6	10,850	1,982	1,553,720	7	116,950
The Province	18,902	8,595,417	516	908,971	18,927	9,215,753	455	829,724

* Including Manitoulin, Rainy River and Thunder Bay.

CHATTEL MORTGAGES—BY OCCUPATIONS.

TABLE II. Showing by occupations or callings of mortgagors, the number and amount of Chattel Mortgages and Renewals on record and undischarged on January 1 and December 31, 1892, respectively, in the province of Ontario.

Occupations.	Chattel mortgages on record January 1, 1892.				Chattel mortgages on record December 31, 1892.			
	To secure existing debt.		For future indorsation.		To secure existing debt.		For future indorsation.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
		$		$		$		$
Agent	274	101,302	7	10,133	283	93,574	12	4,828
Bailiff	13	1,986	....	.....	19	2,963	....	.....
Baker and confectioner	103	38,457	..	....	71	18,470	3	1,307
Barber	80	14,545	5	1,600	75	16,736	3	530
Barrister and solicitor	59	41,400	1	2,500	60	61,812	3	95
Billiard room	9	3,898	....	.... .	13	4,879	....	.....
Blacksmith	97	18,378	2	300	103	21,198	....	.....
Boarding-house keeper	20	4,727	....	.....	19	3,592	....	.....
Book-keeper and accountant	67	24,111	1	74	53	19,158	2	375
Brickmaker	39	31,393	....	.....	46	50,289	1	3,507
Builder and contractor	164	194,471	7	6,979	148	95,982	4	30,075
Butcher	175	44,147	1	172	158	41,896	13	3,394
Cabinet maker	26	11,667	2	365	30	17,977	1	300
Cabman	59	15,204	1	150	54	11,921	....	.....
Carpenter	155	30,782	1	178	151	27,638	2	475
Carriage maker	61	30 372	3	578	46	24,472	....	.....
Carter	56	10,017	4	663	13	8,878	1	120
Clergyman	14	4,916	1	1,200	14	4,654	1	1,175
Clerk	239	72,121	2	813	287	80,421	4	980
Coal and wood dealer	13	4,805	....	.....	20	15,606	....	.....
Cooper	18	3,145	....	....	14	2,282	....	.....
Dairyman	43	9,925	....	.....	61	18,072	1	125
Druggist	63	74,679	5	2,378	59	75,196	1	720
Engineer	50	19,011	....	..	48	17.171	1	975
Farmer (including yeoman)	10,748	3,035,342	241	62,259	10,576	3,062,349	198	55,628
Furniture dealer	32	18,827	1	474	28	16,172	1	800
Gardener	67	14,399	1	50	70	9,432	....	.....
Gentleman	204	94,091	8	17,099	158	89,608	7	36,336
Harnessmaker	36	10,491	....	....	40	8,407	1	500
Hotel-keeper and liquor shop	554	636,473	18	6,070	583	730,942	21	20,185
Jeweller and watchmaker	52	40,399	3	1,619	46	56,966	5	1,828
Laborer	415	45,177	5	412	370	42,167	9	1,119
Laundryman	21	15,617	1	300	13	9,744	....	.....
Livery keeper	181	123,304	6	6,782	193	123,198	6	4,733
Lumberman	124	727,318	16	519,076	140	1,018,495	17	272,242
Machinist	52	31,612	....	.....	53	25,207	3	1,105
Manufacturer	238	517,411	23	67,153	248	638,805	17	215,395
Marble dealer	13	2,623	3	351	10	2,369	1	150
Married woman	441	207,343	12	14,574	440	167,756	14	5,045
Merchant	584	682,166	62	135,655	579	749,597	32	94,662
Miller	71	29,851	6	12,953	73	37,054	1	550
Moulder	9	1,120	....	.....	12	1,602	....	.....
Painter	63	12,100	....	.....	63	13,987	2	170
Photographer	39	9,978	3	312	47	18,318	....	.....
Physician	64	33 774	....	.....	62	41,685	1	1,250
Plasterer	22	2,687	....	....	8	682	....	.....
Plumber	13	3,821	1	1,000	16	7,085	....	.....
Printer and publisher	186	227,327	4	4,240	180	204,550	2	1,698
Salesman	11	4,653	....	.....	16	2,028	....	.....
Saw-mill man	67	58,401	2	1,793	89	56,451	6	39,400
Shoemaker	50	13,876	....	.....	33	7,452	2	120
Tailor	75	25,834	1	100	63	21,891	2	703
Teamster	300	43,725	4	949	275	37,094	5	629
Tinsmith	22	7,317	1	300	36	7,936	....	.....
Traveller	59	14,378	1	500	45	14,539	1	75
Undertaker	24	14,200	....	.....	26	11,270	1	1,500
Unmarried woman	46	19,498	5	1,961	60	23,581	2	285
Widow	187	56,174	2	406	175	58,230	3	1,063
All others	1,935	1,008,651	43	24,500	2,256	1,164,267	42	22,716
Total	18,902	8,595,417	516	908,971	18,927	9,215,753	455	809,724

ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES

FOR THE

PROVINCE OF ONTARIO

1892

PART VI.—LABOR ORGANIZATIONS AND STRIKES AND LOCKOUTS

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ELEVENTH ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES.

PART VI.

To the Honorable John Dryden, Minister of Agriculture:

Sir,—I have the honor to present herewith a report dealing with Labor Organizations in the Province of Ontario, and Strikes and Lockouts in Ontario, together with an appendix containing information in regard to Labor Bureaus, Labor Statistics in various countries, and Legislation affecting Labor in this and other lands; this being Part VI of the Report of the Bureau of Industries for 1892.

Your obedient servant,

C. C. JAMES,
Secretary.

Toronto, Sept. 1, 1893.

PART VI.

LABOR ORGANIZATIONS AND STRIKES AND LOCKOUTS.

With the view to obtaining information in regard to the Labor Organizations of the Province and Strikes and Lockouts, the following circular was prepaid in June, 1892, and sent to every Labor Organization and Friendly Society in Ontario of which the proper address could be obtained, also to nearly one thousand employees of skilled and unskilled labor. The circular explains quite fully the scope and nature of the work undertaken and the information sought :

TORONTO, June 1, 1892.

LABOR STATISTICS.

SIR,—With the object of enlarging the work of this Bureau in connection with the compilation of *labor statistics*, it has been determined to collect and publish such information as may be obtainable this year under the heads given below. It has been thought that such information would be interesting and valuable to the artisan, the mechanic, the skilled and the unskilled laborer, as well as to the employer of labor in Ontario. Other investigations will also probably be undertaken during the year.

1. Statistics as to Labor Organizations, Trades and Labor Councils, Trades Unions, Assemblies of the Knights of Labor—District, Trade and Mixed,—Co-operative Societies, Benefit, Friendly or Insurance Societies ; to include (*a*) name and nature of organization, occupation of membership, date and place of organization ; (*b*) names and addresses of officers ; (*c*) number of members for past five years ; (*d*) official reports of officers ; (*e*) cash benefits to members or families of members in case of sickness, lack of work, superannuation or death ; (*f*) rates of wages and days of employment of members ; (*g*) any special work undertaken for benefit of members.

2. Statistics relating to Strikes and Lockouts in Ontario in 1892, to include (*a*) nature and location of industry ; (*b*) number of persons and of establishments directly affected ; (*c*) cause or object ; (*d*) how inaugurated ; (*e*) date of beginning and of ending ; (*f*) result, whether successful or unsuccessful ; (*g*) strike allowance paid ; (*h*) loss occasioned employees ; (*i*) loss occasioned employers ; (*j*) any other information connected therewith.

3. Dominion and Provincial Legislation affecting labor in Ontario.

To obtain such details and to have them in reliable form the active voluntary assistance of workingmen (organized and unorganized), and of employers of labor is requested. All returns will be treated confidentially and handled impartially, and the results compiled in such form as we trust will be useful for all classes. It is desired that all blank schedules sent to you will be filled out carefully and promptly returned to this Bureau.

I remain,
Yours respectfully,
C. C. JAMES,
Secretary.

LABOR ORGANIZATIONS.

The following schedule dealing with Labor Organizations was then forwarded to be filled in and returned to this Bureau by July 15th :

TORONTO, July 1, 1892.

LABOR RETURN.

The officers of Labor Organizations will please fill out this schedule and return in enclosed envelope (postage free if unsealed) on or about July 15.

C. C. JAMES,
Secretary.

Return of .....
(Give name of organization in full).

Date of Organization .....

Trade or Calling .....

Total Membership (if Trades Council or D. A. of K. of L., (state aggregate represented) on July 1st, in in each year—1888.....; 1889.....; 1890 .....; 1891..... .; 1892.....

Name and address of President .....

Name and address of Secretary .....

Cash benefits paid members or families of members in 1891 in case of—

(*a*) Superannuation.....; (*b*) Lack of employment.....; (*c*) Sickness.....; (*d*) Death.....

Benefits—when, how and to whom payable .....

What special work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.) .....

Average rate of wages of members during the year 1891 .....

Average No. of days of Employment of members during 1891.....

Financial statement (printed copy if available) .....

General remarks .....

In order to make the returns as complete as possible the following circular was sent later on :

TORONTO, August 15th, 1892.

SIR,—About a month ago a circular and a blank form of "Labor Return" were mailed to your address from this office. As the circular referred to fully explained itself further reference thereto is unnecessary here.

The blank form, dated July 1st, 1892, requested officers of labor organizations to fill in the schedule and return in accompanying envelope (postage free if unsealed) on or about July 15. Up to date the return asked for from your association has not reached this Department. Will you be good enough to draw the attention of the proper officer, or the attention of your body to the matter, with a view to having the information sent.

If there are no labor organizations in your municipality, through having gone out of existence or because none have existed within the past five years, will you kindly so enter on the face of the blank and re-mail to this office at your earliest convenience.

If a labor organization exists of which you are not a member, please hand the blank form to some member thereof for presentation to the body, and if there are more than one labor organization, be good enough to send the name of some officer of each so that blank forms may be mailed them from this office.

Another copy of the blank form is enclosed herewith, which, it is to be hoped, will be filled without unnecessary delay and mailed to this Department, as per direction.

C. C. JAMES,
Secretary.

In response to the schedule dated July 1, 1892, (Labor Return) 87 replies were received, of which 66 were available for the purposes intended. The number and location of the various organizations is as follows :

Brantford, city	4	Peterboro', town	1
Chatham, town	2	Smith's Falls, town	1
Cobourg, town	1	St. Catharines, city	2
Cornwall, town	1	St Thomas, city	1
Guelph, city	1	Tilsonburg, town	1
Hamilton, city	7	Toronto, city	24
Kingston, city	2	Woodstock, town	4
London, city	4		
Oshawa, town	2	Total	66
Ottawa, city	8		

The nature of the organizations reporting is as follows :

Trade Unions	46
Trades and Labor Councils	2
Local Assemblies of Knights of Labor	7
District Assemblies of Knights of Labor	3
Benefit Societies	8
Total	66

By trades and callings the organizations are as follows:

Brassworkers' Union	1
Blacksmiths and Helpers' Union	1
Bricklayers and Masons	2
Builders' Laborers	1
Amalgamated Carpenters and Joiners	2
Brotherhood of Carpenters and Joiners of America	3
Cigar Makers	4
Iron Moulders	12
Brotherhood of Locomotive Firemen	1
International Association of Machinists	1
Painters and Decorators	1
Pressmen	1
Amalgamated Journeymen Slaters' Union	1
Stonemasons' International Union	1
International Tailors	6
Typographical Unions	6
Trades and Labor Councils	2
District Assemblies, Knights of Labor	3
Local Assemblies, Knights of Labor	7
Benefit Societies	8

Of the fourteen unions of Iron Moulders in Ontario subordinate to the Iron Moulders' International Union of America, twelve made returns more or less complete in detail, while every branch of the International Typographical Union of North America in the Province responded in like manner. There are six branches of the Cigar Makers' International Union in Ontario, and of these four forwarded returns. Six of the ten branches of the Journeymen Tailors' International Union of America in this Province also sent in the schedules. The Amalgamated Society of Carpenters and Joiners has five branches in Ontario, and of these two sent returns, while the United Brotherhood of Carpenters and Joiners of America having six branches in Ontario, will be on record through the returns made by three of them.

In part explanation of the small number of returns from Assemblies of the Order of the Knights of Labor in Ontario, it may be said, briefly, that under the constitution of that organization, as well under the obligation of its membership, no provision is made for the giving or publication of such information as is solicited in the schedules sent out from this department. This omission is the more striking when it is recollected that in the Preamble of the Constitution of the Order of the Knights of Labor, after a recital of its aims, it says that, "in order to secure these results we demand at the hands of the law-making power of the state and nation (among other things):

"III. The establishment of Bureaus of Labor Statistics, that we may arrive at a correct knowledge of the educational, moral and financial condition of the laboring classes."

Eight exclusively benefit societies made partial or complete reports. These are located as follows, four in Toronto, two in Woodstock, one in Cobourg and one in Oshawa.

RETURNS OF ORGANIZATIONS IN DETAIL.

Brantford.

Cigar Makers' Union No. 59.

Reorganized.....March 15th, 1886.
President.....Jas. Davidson, Brantford.
Secretary.....F. Mather, Brantford.

Total membership on July 1st in each year—1888, 42; 1889, 23; 1890, 20; 1891, 15; 1892, 17.

Cash benefits paid members or families of members in 1891 : in case of lack of employment, $3 ; sickness, $196.

Benefits—Sick Benefits, $5 weekly for 13 weeks ; out-of-work benefits, $3 weekly for 6 weeks ; entitled again after 7 weeks. Strike benefit, $5 weekly for 16 weeks ; $3 after until settled. Death benefit scaling from $50 to $350. Also travelling benefits.

Average wages of members during the year 1891, $400.

Average number of days of employment of members during 1891, 265.

Iron Moulders' Union No. 29.

Date of organization.....About fifteen years ago.
President .....James Brown, Brantford.
Secretary .....Wm. Lake, 81 W. Mill street, Brantford.
Total membership on July 1st in each year—1889, 69 ; 1890, 70 ; 1891, 78 ; 1892, 75.
Cash benefits paid members or families of members in 1891 in case of death, $100.
Benefits—Strike, single men, $5 per week ; married men, $7 per week.
Average rate of wages of members per day during the year 1891, $1.80.
Average number of days of employment of members during 1891, 260.

Typographical Union No. 273 (International).

Date of organization.....24th of Dec., 1890.
President .....George Crooks, *Courier* Office, Brantford.
Secretary.....C. H. Brandt, 35 Charlotte St., Brantford.
Total membership on July 1st in each year—1891, 16 ; 1892, 13.
Cash benefits paid members or families of members in 1891 in case of death, $50.
Benefits payable to heirs.
Average daily rate of wages of members during the year 1891, $1.40.
Average number of days of employment of members during 1891, about 300.

Journeymen Tailors' Union, Branch 117.

Date of organization.....March 10th, 1890.
President .....Edward Passmore, box 513, Brantford.
Secretary.....L. G. Clark, box 513, Brantford.
Total membership on July 1st in each year—1890, 26 ; 1891, 30 ; 1892, 38.
Benefits—Members after three months' membership in good standing, on account of death, $75 ; one year, $100, payable for funeral expenses.
Average rate of wages per week of members during the year 1891, $8.
Average number of days of employment of members during 1891, 280.

CHATHAM.

Journeymen Tailors' Union, Branch 82.

Date of organization.....1889.
President.....Edward Coyne, Chatham.
Secretary.....James Scott, Chatham.
Total membership on July 1st in each year—1889, 21 ; 1890, 27 ; 1891, 30 ; 1892, 31.
Cash benefits paid members or families of members, in 1891, in case of sickness, $9.00.
Average rate of wages per week of members during the year 1891, $9.
Average number of days of employment of members during 1891, 200.

COBOURG.

The Cobourg Car Works Friendly Society.

Date of organization.....March 1st, 1883.
President.....William Kerr, Cobourg.
Secretary.....William Carswell, Cobourg.

Cash benefits paid members or families of members in 1891, in case of sickness, $660 ; death, $75.

Benefits—If only sickness, the member is paid ; in case of death, the wife or children of member, and in case of death of a member's wife, the member is paid.

No special work is carried on for benefit of members. There is a very good library and reading room in the Mechanics' Institute here and a good deal of interest is taken in it by the men, the president of this society being a director.

Average rate of wages of members during the year 1891, about 16 cts. per hour.

Average number of days of employment of members during 1891, about 300.

CORNWALL.

Local Assembly, No. 6583, Knights of Labor.

Date of organization.....
Trade or calling.....Mixed Assembly.
Master Workman.....A. J. Macdonald, Cornwall.
Secretary.....John Brook, box 36, Cornwall.

Total membership on July 1st in each year—1889, 166 ; 1890, 59 ; 1891, 20 ; 1892, 14.

GUELPH.

Iron Moulders' Union No. 212.

Date of organization.....July, 1881.
President.....John Weir, Guelph.
Secretary.....John C. Crowe, Guelph.

Total membership on July 1st in each year—1888, 31 ; 1889, 29 ; 1890, 32 ; 1891, 31 ; 1892, 32.

Benefits—$100 at death or total disability.

Average rate of wages of members during the year 1891, $2.

Average number of days of employment of members during 1891, 290.

HAMILTON.

Bricklayers and Masons' Union No. 1, of Ontario.

Date of organization.....February 10th, 1880.
President.....John Seaman, Steven street, Hamilton.
Secretary.....A. E. Smith, 352 Bold street, Hamilton.

Total membership on July 1st in each year—1888, 118 ; 1889, 86 ; 1890, 124 ; 1891 114 ; 1892, 96.

Cash benefits paid members or families of members in 1191 in case of sickness, $200.50 ; death, $200.

Benefits—To the widows of two deceased members, who each received the sum of $100, the amount fixed by the rules of the Union and payable in cash immediately upon the death of a member.

Wages are a fixed rate of 33½ cents per hour of 9 hours per day, with a Saturday half-holiday, which the men lose.

Average number of days of employment of members during 1891, about 130.

Iron Moulders' Union No. 26.

Date of organization.....1860.
Trade or calling.....Iron and brass.
President.....Michael Basquill.
Secretary.....William Ford.

Total membership on July 1st in each year—1888, 353; 1889, 346; 1890, 325; 1891, 300; 1892, 180.

Cash benefits paid members or families of members in 1891, in case of sickness, $275; death, $150.

Benefits—$100 paid to physician for attendance on members who were ill; $175 in weekly allowances to members unable to work through sickness.

Average rate of wages of members during the year 1891, per day, $2.30.

Average number of days of employment of members during 1891, 210.

Journeymen Tailors' Union No. 149 (International).

Date of organization (existed 22 years as a local body).....Jan. 11th 1892.
President.....W. Burrows, 211 Rebecca St., Hamilton.
Secretary.....T. J. Kelley, 161 Catharine St., Hamilton.

Total membership on July 1st, 1892, 45.

Benefits—At death, from $75 to $100; three months' member represents the former amount; one year, the latter. On death of wife of member, $75.

Average rate of wages of members during the year 1891, $520.

Average number of days of employment of members during 1891, about six months; cannot average like in other trades.

Typographical Union No. 129 (International).

Date of Organization.....September, 1869.
President.....R. R. Hinds, *Times* Office, Hamilton.
Secretary.....Hy. Obermeyer, 141 Walnut St., Hamilton.

Total membership on July 1st in each year—1890, 70; 1891, 73; 1892, 74.

Cash benefits paid members or families of members in 1891, in cases of death, Local $50; International, $50.

Benefits—To widow or nearest relative. Designed principally as a burial fund.

Average rate of wages per week of 58 hours of members during the year 1891, job, $10.50; news, $12.

Amalgamated Society of Carpenters and Joiners.

Date of organization.....1860.
President.....Thomas Towers, Stanley avenue, Hamilton.
Secretary.....T. Mullins, 37 Oak avenue, Hamilton.

Total membership on July 1st in each year—1889, 62; 1890, 57; 1891 57; 1892, 46.

Cash benefits paid members or families of members in 1891, in case of superannuation, $91; lack of employment, $306.55; sickness, $21.50; accident, $250.

Benefits—Superannuation paid quarterly, all other benefits every second week.

Average rate of wages of members during the year 1891, per hour, 22½ cents.

Average number of days of employment of members during 1891, 300.

Cigar Makers' International Union No. 55.

Date of organization.....1864.
President.....Joseph Fletcher, lock box 35, Hamilton.
Secretary.....Thomas O'Dowd, lock box 35, Hamilton.

Total membership on July 1st in each year—1888, 40; 1889, 40; 1890, 40; 1891, 40; 1892, 40.

Cash benefits paid members or families of members in 1891, in case of lack of employment, $235; sickness, $230.27.

Benefits—Paid when due in cash to person entitled; in cases of death, to next of kin.

Average rate of wages per week of members during the year 1891, $6.

Average number of days of employment of members during 1891, 300.

Trades and Labor Council.

Date of organization ..... December 3rd, 1888.
President ..... Wm. McAndrews, 174 Mary St. Hamilton.
Secretary ..... D. R. Gibson, 122 Victoria Ave. N., Hamilton.

Total membership on July 1st in each year—1888, 13 organizations, represented by 39 delegates; 1889, 14 organizations, 42 delegates; 1890, 14 organizations, 42 delegates; 1891, 11 organizations, 55 delegates; 1892, 9 organizations, 55 delegates.

What special work is carried on for benefit of members? The meetings of the Council are open at all times to members of any labor organization, whether in affiliation with the Council or not, and at open meetings, which are held once a month, a subject previously prepared is submitted for discussion in which all who so desire may participate.

Note—In the years 1888, 1889 and 1890 three delegates represented a subordinate organization. This was changed in 1891 and five delegates named as the limit, thus increasing the individual membership of the Council while the number of organizations has decreased. The work of the Council is purely legislative in its character. Local municipal matters, where the interests of labor are affected, and any matter or subject having general effect upon wage-earners, are within the jurisdiction of this Council. Trade matters such as disputes, lockouts, strikes, etc., are only dealt with when appealed to, and then only having advisory power.

KINGSTON.

Iron Moulders' Union No. 236.

Date of organization ..... May 6th, 1886.
President ..... Chas. Rothford, Brock street, Kingston.
Secretary ..... Edward Perry, Division street, Kingston.

Cash benefits paid members or families of members in 1891, in case of lack of employment, $10; sickness, $36.

Benefits—$7 per week on strike and lockout; $3 per week in sickness, and $100 on death.

Average rate of wages of members during the year 1891, $375 to $400.

Average number of days of employment of members during 1891, 250.

Typographical Union No. 204.

Date of organization ..... March 5th, 1886.
President ..... Hugh McNamee, William St., Kingston.
Secretary ..... Edwin E. Horsey, 156 Boyd St., Kingston.

Total membership on July 1st in each year—1891, 23; 1892, 28.

Average rate of wages per week of members during the year 1891, $9.00.

Average number of days of employment of members during 1891, 300.

Financial statement—Receipts for the years 1891-92, $175.83; disbursements $123.84.

LONDON.

Iron Moulders' Union No.37.

Date of organization.....February, 1864.
President.....George Grant, Dundas St., London.
Secretary.....Thos. Dwyer, 188 John St., London.
Total membership on July 1st in each year—1888, 80; 1889, 60; 1890, 25; 1891, 25; 1892, 32.
Benefits—Death claim, $150, payable to nearest relative.
Average rate of wages of members during the year 1891, per day (piece-work), $1.75; per week, $10.

United Brotherhood of Carpenters and Joiners No. 194.

Date of organization.....August, 1886.
President.....Herbert Fountain, Tablot St., London.
Secretary.....E. J. Aust, 706 Dundas St., London.
Total membership on July 1st in each year—1888, 49; 1889, 40; 1890, 31; 1891, 32; 1892, 25.
Benefits—The wife, funeral, $25 on six months' membership; $50 on one year's. Member's funeral, $100 on six months' membership; $200 one one year's. The disability benefit, $100 on six months' membership, $200 on one year's, $300 on three years', and $500 on five years' membership, payable to legal heirs, if not notherwise provided for.
Average rate of wages per day of members during the year 1891, $1.65.
Average number of days of employment of members during 1891, 245 at 9 hours a day.

Cigar Makers' Union No. 288 (International).

Date of organization.....February, 1891.
President.....John McLeod, Simcoe Street, London.
Secretary.....W. Bryan, 20 Horton Street, London.
Total membership on July 1st in each year—1891, 34; 1892, 54.
Cash benefits paid members or families of members in 1891, in cases of lack of employment, $162.85; sickness, $207.25.
Benefits—Sick benefits paid weekly, $5.00; death benefits, after one year's membership, $50; five years', $200; ten years', $350; fifteen years', $550, all to the nearest relative. By death of a wife of a member, $40 after a membership of two years.
Average rate of wages per week of members during the year 1891, $6.
Average number of days of employment of members during 1891, about 300, at 10 hours a day.

Typographical Union No. 133.

Date of organization.....November, 1869.
President.....F. Gee, *Free Press* Office, London.
Secretary.....F. Plant, P. O. Box 383, London.
Total membership on July 1st in each year—1889, 52; 1890, 52; 1891, 53; 1892, 59.
Cash benefits paid members or families of members in 1891, in case of sickness, $78.
Benefits—When unable to follow employment through illness, payble weekly, $3 per week for five weeks to member or member's family.
Average rate of wages of members during the year 1891: As the majority of those employed at the printing business work by the piece, it is impossible to give accurate information.

OSHAWA.

Iron Moulders' Union No. 136.

Date of organization.....March, 1873.
President.....John R. Jewell.
Secretary.....Chas. H. Giles, Box 233, Oshawa.
Total membership on July 1st in each year—1888, 90; 1889, 85; 1890, 63; 1891, 60; 1892, 69.
Cash benefits paid members or families of members in 1891, in case of sickness, $42.
Benefits—payable bi-weekly, in cash, to members who were sick.
Average rate of wages per day of members during the year 1891, $2.25.
Average number of days of employment of members during 1891, 250.

R. S. Williams & Sons' Mutual Benefit Society.

Date of organization.....June 8th, 1890.
Trade or calling.....Piano manufacturers.
President.....John Tucker.
Secretary.....H. Saunders, Oshawa.
Total membership on July 1st in each year—1890, 64; 1891, 45; 1892, 90.
Cash benefits paid members or families of members in 1891, in case of sickness (including medical fee), $140.
Benefits—After being a member for two months—weekly, at the rate $3 and doctor's attendance and medicine, to members in good standing.
Average number of days of employment of members during 1891: Every working day the factory is open. No lost time.

OTTAWA.

Bricklayers and Masons' International Union No. 7.

Date of organization.....November 1st, 1889.
President.....Rollo Crain, 300 James St., Ottawa.
Secretary.....Alex. R. Macdonald, 12 Lochiel St., Ottawa.
Total membership on July 1st in each year—1889, 96; 1890, 112; 1891, 116; 1892, 96.
Cash benefits—none attached to union.
Benefits—Amount paid to sustain strikes and lock-outs in 1891, $196.50; since organization, $730, principally occurring in the United States; one strike in Toronto for which $80 were paid.
What special work (if any) is carried on for benefit of members (reading rooms, evening, classes, etc.)? None directly. Members advised to and quite a number have joined Mechanics' Institute, which is in same building as Labor Hall
Average rate of wages of members during the year 1891, 33⅓ cents per hour for 9 hours per day.
Average number of days of employment of members during 1891, 240.

Iron Moulders' Union No. 275.

Date of organization.....October 8th, 1891.
President.....T. McCusker, 5 Henderson Ave, Ottawa.
Secretary.....I. Locke, 14 Alexander Street, Ottawa.
Total membership on July 1st in each year—1891, 21; 1892, 15.
Average rate of wages per day of members during the year 1891, $2.
Average number of days of employment of members during 1891, 307.

Printing Pressmen's Union No. 5.

Date of organization.....January, 1879.
President.....E. J. Pearce, 253 Bank Street, Ottawa.
Secretary.....P. G. McCann, 384 Metcalf St., Ottawa.
Total membership on July 1st in each year—1888, 18; 1889, 19; 1890, 20; 1891, 22; 1892, 22.
Benefits—Death benefit only, payble to family of deceased.
Average rate of wages per week of 54 hours of members during the year 1891, $13.50.
Average number of days of employment of members during 1891, 300.

Typographical Union No. 102.

Date of organization.....1867.
President.....G. A. Lavigne, St. Patrick St., Ottawa.
Secretary.....A. Choquette, 48 Water St., Ottawa.
Total membership on July 1st in each year—1892, 200.
Benefits—Four dollars per week for nine weeks in each year to sick members in good standing; at death, $100.
What special work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.)? Ten cents per month levied on membership to sustain Childs-Drexel Home for Union Printers (old and infirm), and a levy of 50 cents per capita for burial expenses of deceased members.

Tailors' Union, No. 143 (I. T. U. of America).

Date of organization.....October 1st, 1890.
President.....George Powers.
Secretary.....Jas. McCracken, 191 Gloucester street.
Total membership on July 1st in each year—1891, 30; 1892, 45.
Cash benefits paid members or families of members in 1891, in case of strike, $170.
Benefits—$100 paid at the death of a member; $75 on the death of a member's wife. Members, while on strike, $6 per week each.
Average rate of wages per week of the members during the year 1891, $9.
Average number of days of employment of members during 1891, 250.

Frontenac Assembly No. 193, K. of L.

Date of organization.....October 25th, 1888.
Master Workman.....Louis Beaucage, 22 McGee St., Ottawa.
Secretary.....A. F. Marchand, 485 Sussex St., Ottawa.
Trade or calling—Mixed.
Total membership on July 1st in each year—1888, 40; 1889, 20; 1890, 35; 1891, 30; 1892, 26.
What special work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.)? Reading rooms.

Chaudiere Assembly No. 2966, K. of L.

Date of organization.....November 20th, 1890.
Trade or calling.....Mill men and lumber handlers.
Master Workman.....Albert Chapman 18 Balsam street.
Secretary.....Mathew Murphy.
Total membership on July 1st in each year—1890, 35; 1891, 225; 1892, 475.
Cash benefits paid members or families of members in 1891, in case of sickness, $57.25; death, $9.

Benefits—Sick benefit of $2 per week, payable to beneficiary for nine weeks. There is also an Almoner's Fund which is contributed to for sick purposes.

What special work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.)? Lectures on Political Economy and Social Reform are held once a month during winter months.

Average rate of wages per week of members during the year 1891, $7.

Average number of days of employment of members during 1891, 200.

District Assembly No. 6, K. of L.

Date of organization ..... March, 1892.
Trade or calling ..... Mixed Trade Assemblies and Labor Assemblies.
District Master Workman .... J. W. Patterson, 316 Bay street, Ottawa.
District Secretary ..... E. Ouellette, Revere House, Sussex St., Ottawa.

Average rate of wages per day of members during the year 1891, trades, $2; labor, $1.25.

Average number of days of employment of members during 1891, trades, 300; labor, 250.

Note—This District Assembly is composed of representatives of all Local Assemblies of Knights of Labor in Ottawa City, and in the counties of Carleton, Russell and Ottawa. Owing to the lateness of its formation it is found impossible to give accurate data. The local assemblies referred to are mainly composed of lumber men and ordinary laboring men:

PETERBOROUGH.

Iron Moulders' Union No. 191.

Date of organization ..... July 17th, 1874.
President ..... Robert Scott, Box 481, Peterborough.
Secretary ..... Robert Mulligan, Box 481, Peterborough.

Total membership on July 1st in each year—1888, 30; 1889, 40; 1890, 45; 1891, 44; 1892, 40.

Cash benefits paid members or families of members in 1891, in case of death, $100.

Benefits—To parents or nearest relative.

Average rate of wages per day of members during the year 1891. $2.

Average number of days of employment of members during 1891, 180.

SMITH'S FALLS.

Iron Moulders' Union No. 801.

Date of organization ..... May 30th, 1887.
President ..... George Ferguson.
Secretary ..... Daniel Coughlin, Box 176, Smith's Falls.

Total membership on July 1st in each year—1888, 40; 1889, 45; 1890, 50; 1891, 40; 1892, 30.

Average rate of wages per day of members in the year 1891, $1.75.

Average number of days of employment of members during 1891, 260.

ST. CATHARINES.

Brotherhood of Carpenters and Joiners' Union No. 38.

Date of organization ..... February, 1883.
President ..... Benjamin Back, St. Catharines.
Secretary ..... Wm. McIntosh, St. Catharines.

Total membership on July 1st in each year—1888, 60; 1889, 57; 1890, 54; 1891, 53; 1892, 45.

Cash benefits paid members or families of members in 1891, in case of sickness, $66 ; death, $200.

Benefits—Sick benefit, weekly, $3 per week ; death benefit, payable to widow or other nearest relative.

What special work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.)? Visiting the sick, debates, etc.

Average rate of wages of members during the year 1891, 22½ cents per hour.

Average number of days of employment of members during 1891, 234.

Cigar Makers' Union No. 149.

Date of organization.....1882.
President .....C. E. Tansey, Box 158, St. Catharines.

Cash benefits paid members or families of members in 1891—in case of lack employment, $26 ; sickness, $10.

Benefits—Pay allowances for strikes, sickness, out of work, travelling and death.

Average rate of wages per week of members during the year 1891, $10.

Average number of days of employment of members during 1891, 275.

ST. THOMAS.

Journeymen Tailors' Union of America No. 141.

Date of organization.....September 7, 1890.
President.....J. E. Morgan, St. Thomas.
Secretary.....H. H. Peacock.

Total membership on July 1st in each year—1890, 38 ; 1891, 42 ; 1892, 52.

Cash benefits paid members or families of members in 1891, in case of death, $75.

Benefits—On death, payable to nearest relative of deceased.

Average rate of wages per day of members during the year 1891, $1.25.

Average number of days of employment of members during 1891, 250.

TILSONBURG.

Iron Moulders' Union No. 256.

Date of organization .....1889.
President .....James Hearn.
Secretary .....George Ball.

Total membership on July 1st in each year—1889, 12 ; 1890, 12 ; 1861, 12 ; 1892, 4.

Average rate of wages per day of members during the year 1891, $1.25.

Average number of days of employment of members during 1891, 200.

TORONTO.

Amalgamated Society of Carpenters and Joiners (Branch No. 1).

Date of organization .....June, 1860.
President.....W. Kendall, 255 Sackville St., Toronto.
Secretary .....J. Rose, 11 Leonard Ave., Toronto.

Total membership on July 1st in each year—1888, 116 ; 1889, 82; 1890, 72 ; 1891 53 ; 1892, 50.

Cash benefits paid members or families of members in 1891, in cases of lack of employment, $385 50 ; sickness, $70 ; tool benefit, $4.55.

Benefits—Grant from contingent fund to needy members, $15 ; tools stolen or burned replaced to the amount of $100 per man ; unemployed benefit for 12 weeks, $2.50 per week

12 weeks more, $1.50 per week; sick pay for 26 weeks, $3 per week; continued illness, $1.50 per week; funeral benefit, $60; accident benefit, $500; and $250 superannuation per annum for life after 25 years' membership; $2 per week strike pay; $3.75 per week and full rate of wages paid to men who held office during a strike and persecuted for same.

Average rate of wages of members during the year 1891: 25 cents per hour; no member allowed to work for less than 22½ cents per hour.

Average number of days of employment of members during 1891, 44 weeks or 264 days of 9 hours, and 5 hours on Saturday.

Amalgamated Journeymen Slaters' Union.

Date of organization.....March 4th, 1890.
President.....Arthur J. Moody, Mountstephen St., Toronto.
Secretary.....Alex. Blackhall, 292 Manning Av., Toronto.
Total membership on 1st July in each year—1890, 35; 1891, 34; 1892, 27.
Average rate of wages per week of members during the year 1891, about, $8.
Average number of days of employment of members during 1891, about 210, 9 hours a day.

The Blacksmiths' and Helpers' Union No. 1.

Date of organization.....September 23rd, 1891.
President.....Harry Ley, 311 Queen St. East, Toronto.
Secretary.....Edwin Edwards, 134 Duchess St., Toronto.
Total membership on July 1st in each year—1892, 62.
Average rate of wages per day of members during 1891: Blacksmiths, $1.85; helpers, $1.

International Association of Machinists, Lodge 235.

Date of organization.....February 13th, 1892.
President.....L. H. Gibbens, 363 Brock Ave.
Secretary.....R. H. Dee, 33 Manning Ave.
Total membership on July 1st in each year—1892, 103.
Benefits—No benefits until the expiration of six months after initiation, after that, $2 per week.
Average rate of wages per day of 10 hours of members during the year 1891, $1.96
Average number of days employment of members during 1891, 295.

Iron Moulders' Union No. 28.

Date of organization.....June 8th, 1863.
President.....Robert Emmet, 289 Farley Ave., Toronto.
Secretary.....David Black, jr., 70 Lippincott St., Toronto.
Total membership on July 1st in each year—1888, 210; 1889, 261; 1890, 203; 1891, 233; 1892, 137.
Cash benefits paid members or families of members in 1891, in case of sickness, $252.35; death, $100.
Benefits—Sickness, $4 per week for first six weeks, $3 per week for second six weeks and $2 per week for remainder of six months; death, $30 from the local body and $100 from the International.
Average rate of wages of wages per day of members during the year 1891, $2.40.
Average number of days of employment of members during 1891, about 240.

Brotherhood of Locomotive Firemen (Queen City Lodge).

Date of organization.....July 1st, 1885.
President.....W. B. Ritchie, Toronto Junction.
Secretary.....F. G. Drewitt, 40 Gordon St., Toronto.

Total membership on July 1st in each year—1888, 24; 1889, 30; 1890, 40; 1891, 55; 1892, 55.

Benefits—Have a system of insurance payable at death to whomsoever a member desires to leave it to. No death has occurred since organization of the lodge.

Average rate of wages per month of members during the year 1891 .....$45.

Average number of days of employment of members during 1891....about 300.

Brotherhood of Painters and Decorators of America (Local Union No. 3).

Date of organization .....May, 1887.

President .....Geo. M. Rogers, 41 Jersey Av., Toronto.

Secretary .....Wm. Crawford, 8 Albany Av, Toronto.

Total membership on July 1st in each year—1888, 175; 1889, 140; 1890, 135; 2891, 130; 1892, 103.

Cash benefits paid members or families of members in 1891, in case of death, $200.

Benefits—Payable to the legal heir immediately after death by order of the brotherhood.

Average rate of wages per week of members during the year 1891, about $8 25.

Average number of days of employment of members during 1891, about 300, nine hours per day.

Stone Masons' International Union No. 1 of Canada.

Date of organization .....December, 1881.

President.....David Coleman, 115 Fern Ave., Toronto.

Secretary .....George Martin. 43 Hammond Ave., Toronto.

Total membership on July 1st in each year—1888, 160; 1889, 190; 1890, 210; 1891. 250; 1892, 160.

Cash benefits paid members or families of members in 1891, in case of death, $50.

Benefits—When a member is reported dead $50 cash is immediately paid to the widow or other relatives to defray funeral expenses.

Average rate of wages per day of members during the year 1891, $3.15.

Average number of days employment of members during the year 1891, 180.

Journeymen Tailors' Union of America (Local Union No. 132).

Date of organization .....July 1st, 1890.

President .....Walter Gibbons.

Secretary .....Jas. Michael, 269 Queen St. West (box 512).

Total membership on July 1st in each year—1891, 150; 1892, 170.

Benefits—In sickness, $2 per week; on death of member, $100; on death of member's wife, $75; paid as soon as papers are sent in and found correct.

Average rate of wages per week of members during the year 1891, about $9.

Typographical Union No. 91 (International).

Date of organization.....February 29th, 1844.

President..... James Coulter (box 543).

Secretary .....Amos Pudsey.

Total membership on July 1st in each year—1888, 430; 1889, 446; 1890, 494; 1891, 508; 1892, 513.

Cash benefits paid members or families of members in 1891, in cases of sickness, $780; death, $750.

Benefits—Sick benefits are paid weekly to the member; death benefits are paid to nearest relatives of the deceased member entitled to receive them.

Average rate of wages per week of members during the year 1891: Union scale, $11.00.

Average number of days of employment of members during 1891, about 260.

Trades and Labor Council.

Date of organization ..... 1881.
President ..... Thos. W. Banton, 116 Christie St., Toronto.
Secretary ..... Fred. C. Cribbin, 225 Richmond St. West.

International Brotherhood of Brassworkers, No. 23.

Date of organization ..... June 29, 1891.
President ..... T. B. Montgomery, 15 Saurin St., Toronto.
Secretary ..... A. B. Otter, 402 Parliament St., Toronto.
Total membership on July 1st in each year—1891, 35 ; 1892, 56.
Cash benefits paid members or families of members in 1891, in case of sickness, $225
Benefits—The benefits are paid weekly to members who are sick at the rate of $5 per week. All benefit funds are sent to headquarters at Detroit, Mich.
Average rate of wages per week of members during the year 1891, $10.50.
Average number of days of employment of members during 1891, 300.

Excelsior Assembly No. 2305, K. of L.

Date of organization ..... October 4th, 1882.
Trade or calling ..... Mechanics and laborers.
Master Workman ..... D. J. O'Donoghue, 95 D'Arcy St., Toronto.
Secretary ..... James H. Gilmour, 183 Victoria St., "
Average rate of wages per week of members during the year 1891, $11.
Average number of days of employment during 1891, about 300.

United Brotherhood of Carpenters and Joiners of America (Union No. 27).

Date of organization ..... August, 1881.
President ..... Sydney Jones, 58 Albany Ave., Toronto.
Secretary ..... P. F. Farish, 54 " "
Total membership on July 1st in each year—1888, 100 ; 1889, 100 ; 1890, 120 ; 1891, 150 ; 1892, 116.
Cash benefits paid members or families of members in 1891 in case of sickness, $240.
Average rate of wages per month of members during the year 1891, about $36.37.
Average number of days of employment of members during 1891, about 180.

International Builders' Laborers' Union.

Date of organization ..... March 31st, 1881.
Trade or calling ..... Builders' laborers.
President ..... R. Reddall, 55 Monroe St. West.
Secretary ..... H. T Benson, 141 Amelia St.
Total membership on July 1st in each year—1888, 1,002 ; 1889, 999 ; 1890, 1,001 ; 1891, 849 ; 1892, 648.
Cash benefits paid members or families of members in 1891, in case of death, $525.
Benefits—To wife, mother, or other relative, as the case may be.
What special work, if any, is carried on for the benefit of members (reading rooms, evening classes, etc)? Reading and recreation rooms are sustained by this organization.
Average rate of wages of members during the year 1891, $306.
Average number of days of employment of members during 1891, 170, 9 hours per day.

Local Assembly No. 2622, Knights of Labor.

Date of organization ..... (Mixed trades and labor), April 27th, 1883.
Master Workman ..... Wm. Thompson, 90 Claremont street, Toronto.
Secretary ..... Hugh McCaffery, 83 Wellington avenue, Toronto.
Total membership on July 1st in each year—1888, 90 ; 1889, 95 ; 1890, 125 ; 1891, 100 ; 1892, 100.

Cash benefits paid members or families of members in 1891: Sickness, $225. In case of lack of employment, dues remitted to members who were out of work.

Benefits—On the death of a member the Almoner pays the full expenses of funerals, no stated sum. He also exercises generous consideration in all cases of sickness or distress.

What special work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.)? Have a small library in hall and loan out the books to the members in turn. Limited means do not allow all that is desired as to this library.

Average rate of wages per day of members during the year 1891: Mechanics, $1.75; laborers, $1.25.

Average number of days of employment of members during 1891, 225.

Mayflower Assembly No. 6564, K. of L. ('Longshoremen)

Date of organization.....April 19th, 1886.
Master Workman.....J. J. Walsh, Lock Box 2560, Toronto.
Secretary.....D. S. McCartney, Lock Box, 2560, Toronto.

Total membership on July 1st in each year—1888, 77; 1889, 54; 1890, 37; 1891, 43; 1892, 39.

Average rate of wages of members during the year 1891: About $4 per day while working, but sometimes a week or a fortnight without getting a boat.

Average number of days of employment of members during 1891: Owing to the employment being only for a season, and so often idle during the time, the average cannot well be given.

Local Assembly No. 5743, K. of L. (Bookbinders)

Date of organization.....February 25th, 1886.
Master Workman.....J. W. Bailey, 47 Edward street, Toronto.
Secretary.....Wm. Glockling, 37 Agnes street, Toronto.

Benefits—Have just started a beneficiary feature in connection with this assembly, which comes into practical effect next January.

What special work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.)? In the Order of Knights of Labor there is an Order of Business which calls for readings, poems, etc., and by this means members are educated.

Average rate of wages per week of members during the year 1891, $9.25.

Average number of days of employment of members during 1891, 270.

Wheatsheaf Assembly No. 3499, K. of L. (Bakers)

Date of organization.....1885.
Master Workman.....Arthur Callan, 36 Carlisle street.
Secretary.....Henry F. West, cor. Elm and Terauley Sts.

Total membership on July 1st in each year—1888, 175; 1889, 160; 1890, 100; 1891, 40; 1892, 60.

Average rate of wages per week of members during 1891, $8.00.

Average number of days of employment of members in 1891, four days per week.

District Assembly No. 125, Knights of Labor.

Date of organization.....May 6th, 1886.

Trade or calling: A central body composed of representatives of the several Local Assemblies within a defined limit, and with specified powers.

District Master Workman.....David A. Carey, 95 Markham St., Toronto.
District Secretary.....Robert Glockling, 114 William St., Toronto.

Benefits—Does not dispense financial benefits.

What work (if any) is carried on for benefit of members (reading rooms, evening classes, etc.)? Generally of an educational character.

The Globe Employees' Benefit Association.

Date of organization.....March 31st, 1885.
President .....Allan S. Thompson, *Globe* Office.
Secretary .....T. Jeffery. "

Cash benefits paid members or families of members, in 1891, in cases of sickness, $164 ; death, $60.

Benefits—$5 per week in case of sickness, payable weekly ; $60 in case of death ; 50 per cent. rebate in case of members leaving employ, less benefits received.

The Heintzman & Co. Employees' Benefit Society.

Date of organization .....January 23rd, 1889.
Trade or calling .....Piano Makers.
President.....T. H. Eagen, 80 Grange avenue.
Secretary.....A. J. Linton, 11 Northcote avenue.

Total membership on July 1st in each year—1889, 86 ; 1890, 97 ; 1891, 62 ; 1892, 54.

Cash benefits paid members or families of members in 1891, in case of sickness, $131.28.

Benefits—Payable to members on doctor's certificate being produced as to duration of sickness.

Average rate of wages of members during 1891, per day, $2.

Average number of days of employment of members during 1891, 280.

Mail Sick Benefit Association.

Date of organization .....January 12th, 1891.
Trade or calling,.....Compositors.
President.....J. J. Wilder, 84 Wyatt Avenue.
Secretary.....A. Lamont, 50 Wyatt Avenue.
Total membership on July 1st in each year—1891, 42 ; 1892, 43.

Benefits—When a member has been two weeks on the sick list he receives the sum of $10 ; no allowance for less than two weeks' illness ; $5 per week paid for ten consecutive weeks' illness, or $50 in all.

Average rates of wages of members during the year 1891—per week, about $13.

Average number of days of employment of members during 1891, 208 days.

The St. Lawrence Foundry Employees' Mutual Benefit Society.

Date of organization.....July, 1890.
President.....Thos. J. Sedgwick, 154 Sackville St.
Secretary .....John S. Ferguson, 227½ George St.
Total membership in 1891, 105.

Cash benefits paid members or families of members in 1891, sickness and accident, $577.99 ; death, $35.

Benefits, in case of sickness or accident, every two weeks to members ; in case of death, to members of family.

WOODSTOCK.

Iron Moulders' Union, No. 310.

Date of organization ..... February 16th, 1892.
President ..... James Allan, Peel Street, Woodstock.
Secretary ..... William Lucas, Woodstock.
Total membership on July 1st in each year—1892, 32.
Benefits—When, how and to whom payable: Death benefit of $100, payable to family or heirs of deceased member.
Average rates of wages of members during the year 1892: No record.
Average number of days of employment during 1891: No record, as one shop has opened only this year, and the other shop ran very irregularly.

Massey-Harris Employees' Mutual Benefit Society.

Date of organization ..... January, 1893.
President ..... John R. Patterson, Woodstock.
Secretary ..... John Anderson, Woodstock.

The Karn Employees' Mutual Benefit Association.

Date of organization ..... December 3rd, 1890.
Trade or calling: The different trades necessary to piano and organ manufacturing.
President ..... W. E. Walrond, Woodstock.
Secretary ..... A. J. Watford, Woodstock.
Total membership on July 1st in each year—1891, 70; 1892, 95.
Cash benefits paid members or families of members in 1891, in case of sickness, $140.75; deaths, $25.
Benefits—$3 weekly, in case of sickness, for 12 weeks; and for the next twelve weeks, $1.50 weekly, payable to the nearest relative in case of death. There is also a funeral benefit of $25.
Average rates of wages of members during the year 1891, per day, about $1.60.
Average number of days of employment of members during 1891, 215.

TOTAL MEMBERSHIP ON JULY 1ST IN EACH YEAR.

	1888	1889	1890	1891	1892
BRANTFORD.					
Cigar Makers' Union No. 59	42	23	20	15	17
Iron Moulders' Union No. 29	.....	69	70	78	75
Journeymen Tailors' Union No. 117	.....	.....	26	30	38
Typographical Union No. 273	.....	.....	.....	16	13
CHATHAM.					
Journeymen Tailors' Union No. 82	.....	21	27	30	31
CORNWALL.					
Local Assembly No. 6583, Knights of Labor	.....	166	59	20	14
GUELPH.					
Iron Moulders' Union No. 212	31	29	32	31	32
HAMILTON.					
Amalgamated Society of Carpenters and Joiners	.....	62	57	51	46
Bricklayers and Masons' Union No. 1 of Ontario	118	86	124	114	96
Cigar Makers' International Union (average)	40	40	40	40	40
Iron Moulders' Union No. 26	353	346	325	300	180
Journeymen Tailors' Union No. 149	.....	.....	.....	.....	45
Typographical Union No. 129	.....	.....	70	73	74
Trades and Labor Council (delegates)	39	42	42	55	55
KINGSTON.					
Iron Moulders' Union No. 236	40	40	35	30	20
Typographical Union No. 204	.....	.....	.....	23	28
LONDON.					
Cigar Makers' Benevolent and Protective Union No. 278	.....	.....	.....	47	51
Iron Moulders' Union No. 37	80	60	25	25	32
Typographical Union No. 133	.....	52	52	53	59
United Brotherhood of Carpenters and Joiners of America	49	40	31	32	25
OSHAWA.					
Iron Moulders' Union No. 136	90	85	63	60	69
R. S. Williams & Sons' Mutual Benefit Society	.....	.....	64	45	90
OTTAWA.					
Bricklayers and Masons International Union No. 7	.....	96	112	116	96
Iron Moulders' Union No. 275	.....	.....	.....	21	15
Printing Pressmen's Union No. 5	18	19	20	22	22
Journeymen Tailors' Union No. 143 (International)	.....	.....	.....	30	45
Typographical Union No. 102	.....	.....	.....	.....	200
Local Assembly No. 193, Knights of Labor	40	20	35	30	26
District Assembly No. 6, K. of L. (aggregate represented)	.....	.....	.....	.....	2,000
Chaudiere Assembly No. 2966, K. of L. (mill men, etc.)	.....	.....	35	225	475

TOTAL MEMBERSHIP ON JULY 1ST OF EACH YEAR—*Concluded.*

	1888	1889	1890	1891	1892
PETERBOROUGH.					
Iron Moulders' Union No. 191	30	40	45	44	40
SMITH'S FALLS.					
Iron Moulders' Union No. 801	40	45	50	40	30
ST. CATHARINES.					
Brotherhood of Carpenters and Joiners' Union No. 38	60	57	54	56	45
ST. THOMAS.					
Journeymen Tailors' Union No. 141			38	42	52
TILSONBURG.					
Iron Moulders' Union No. 256		12	12	12	4
TORONTO.					
Builders' Laborers' International Union	1,002	999	1,001	849	648
Blacksmiths and Helpers' Union No. 1, Toronto					62
Brotherhood of Locomotive Firemen (Queen City Lodge)	24	30	40	55	55
Amalgamated Society of Carpenters and Joiners, Branch 1	116	82	72	53	50
United Brotherhood of Carpenters and Joiners of America, Union 27	100	100	120	150	116
Iron Moulders' Union No. 28	210	261	203	133	137
Brotherhood Locomotive Firemen (Queen City Lodge)	25	30	40	55	55
International Association of Machinists, Lodge 235					103
Brotherhood of Painters and Decorators of America, Union No. 3	175	140	135	130	103
Amalgamated Journeymen Slaters' Society			35	34	27
Stonemasons' International Union No. 1, of Ontario	160	190	210	250	160
Journeymen Tailors' Union No. 132.				150	170
Typopraphical Union No. 91	430	446	494	508	513
Local Assembly 2622 Knights of Labor	90	95	125	100	100
Local Assembly No. 6564	71	54	37	43	39
Local Assembly No. 3499	175	160	100	40	60
International Brotherhood of Brassworkers, No. 23				35	56
Mail Sick Benefit Association				42	43
The Heintzman & Co. Employees' Benefit Society			97	62	54
St. Lawrence Foundry Employees' Mutual Benefit Society				105	
WOODSTOCK.					
Iron Moulders' Union No. 310					32
The Karn Employees' Mutual Benefit Association				70	95

Average Wages and Days of Employment.

Occupations.	Average No. of days employed in	Average rates of wages during year
	1891:	1891:
Brantford—		
Cigar Makers' Union No. 59	265	$400.
Iron Moulders' Union No. 29	260	$1.80 per day.
Journeymen Tailors' Union No. 117	280	$8 per week.
Typographical Union No. 273	300	$1.40 per day.
Chatham—		
Journeymen Tailors' Union No. 82	200	$9 per week.
Guelph—		
Iron Moulders' Union No. 212	290	$2 per day.
Hamilton—		
Am. Society of Carpenters and Joiners	300	22½ cents per hour.
Cigar Makers' International Union No. 55	200	$6 per week.
Bricklayers and Masons' Union No. 1 of Ontario	130	33½ cents per hour.
Journeymen Tailors' Union No. 149	.....	$520.
Typographical Union No. 129	58 hours per week	$10.50 a week in job rooms. $12 a week in news rooms.
Kingston—		
Iron Moulders' Union No. 236	250	$375 to $400.
Typographical Union No. 204	300	$9 per week.
London—		
Cigar Makers' Union No. 288	300	$6 per week.
Iron Moulders' Union No. 37	.....	$10 per week.
Brotherhood Carpenters' and Joiners' Union No. 194	245	$1.65 per day.
Oshawa—		
Iron Moulders' Union No. 136	250	$2.25 per day.
R. S. Williams & Sons' Mutual Benefit Society	313	
Ottawa —		
Bricklayers and Masons' International Union No. 7	240	33⅓ cents per hour.
Iron Moulders' Union No. 275	307	$2 per day.
Printing Pressmen's Union No. 5	300	$13.50 per week of 54 hours.
Tailors' Union No. 143	250	$9 per week.
Typographical Union No. 102	270	$11 per week.
Chaudiere Assembly No. 2966, K. of L. (Millmen, etc)	200	$7 per week.
Smith's Falls—		
Iron Moulders' Union No. 801	260	$1.75 per day.
St. Catharines—		
Brotherhood of Carpenters and Joiners	234	22½ cents per hour.
Cigar Makers' Union No. 140	275	$10 per week.
St. Thomas—		
Journeymen Tailors' Union No. 141	250	$1.25 per day.
Tilsonburg—		
Iron Moulders' Union No. 256	200	$1.75 per day.
Toronto—		
Am. Society of Carpenters and Joiners	264	22 cents per hour.
Blacksmiths and Helpers' Union	.....	Blacksmiths, $1.85 per day. Helpers, $1 per day.
Bro. of Carpenters and Joiners' Union No. 27	180	$36.37 per month.
Iron Moulders' Union No. 28	240	$2.40 per day.
Bro. Locomotive Firemen	300	$48 per month.
Machinists' International Association	296	$1.96 per day of 10 hours.
Bro. of Painters' and Decorators' Union No. 3	300	$8.25 per week.
Am. Journeymen Slaters' Society	210	About $8 per week.
Stonemasons' National Union No. 1 of Ontario	180	35 cents per hour.
Journeymen Tailors' Union No. 132	300	$9 per week
Typographical Union No. 91, about	260	$11 25 per week.
Local Assembly 2622, K. of L. (Mixed)	225	Mechanics, $1.75 per day. Laborers, $1.25 per day.
Mayflower Assembly 6564 ('Longshoremen)	when work'g	$4 per day.
Local Assembly 5743, K. of L. (Bookbinders)	270	$9.25 per week.
Wheatsheaf Assembly, K. of L. 3499 (Bakers, etc.)	208	$8 per week.
Excelsior Assembly No. 2305, K. of L.	300	$11 per week.
Int. Brotherhood of Brassworkers, No. 3	300	$10.50 per week.
Int. Builders' Laborers' Union	170	$1.80 per day.
The Heintzman & Co. Employees Benefit Society	280	$2 per day.
The *Mail* Sick Benefit Association	208	About $13 per week.
Peterborough—		
Iron Moulders' Union No. 191	180	$2 per day.
Woodstock—		
The Karn Employees Mutual Benefit Association	313	$1.60 per day.
Massey-Harris Employees Mutual Benefit Association	.....	

Benefits Paid Members or Members' Families.

Cash Benefits paid members or members' families in 1891.	Superannuation.	Lack of employment.	Sickness.	Death.
	$ c.	$ c.	$ c.	$ c.
Brantford—				
Cigar Makers' Union No. 59		3 00	196 00	
Iron Moulders' Union No. 29				100 00
Typographical Union No. 273				50 00
Journeymen Tailors' Union No. 117				100 00
Massey-Harris Co., Relief Association			648 00	
Chatham—				
Journeymen Tailors' Union No. 82			9 00	
Cobourg—				
The Cobourg Car Works Friendly Society			660 00	75 00
Hamilton—				
Am. Society of Carpenters and Joiners	91 00	306 55	271 50	
Iron Moulders' Union No. 26			275 00	150 00
Journeymen Tailors' Local Union No. 149 { Member				100 00
Journeymen Tailors' Local Union No. 149 { Wife				75 00
Typographical Union No. 129				100 00
Bricklayers and Masons' Union No. 1, of Ontario			200 50	200 00
Cigar Makers' International Union		235 00	230 27	
Kingston—				
Iron Moulders' Int. Union No. 236		10 00		
London—				
Cigar Makers' Benefit & Protective Union No. 278 Strike, $142.35; out of work, $20.50		162 85	207 25	
Iron Moulders' Union No. 37		20 00		
Typographical Union No. 133		78 00		
Oshawa—				
Iron Moulders' Union No. 136			42 00	
R. S. Williams & Sons' Mutual Benefit Society			140 00	
Ottawa—				
Journeymen Tailors' Union No. 143 (strike)		170 00		
International Typographical Union No. 102			40 00	100 00
Chaudiere Assembly No. 2966, K. of L			57 25	9 00
Peterborough—				
Iron Moulders' Union No. 191				100 00
St. Catharines—				
Bro. Carpenters and Joiners No. 38			66 00	200 00
Cigar Makers' Union No. 140		26 00	10 00	
St. Thomas—				
Journeymen Tailors' Union				75 00
Toronto—				
Am. Society of Carpenters and Joiners—loss of tools, $4.55; out of work, $385.50		390 05	85 00	
Bro. of Carpenters and Joiners of America, Union No. 27			240 00	
Iron Moulders' Union No. 28			90 00	130 00
Bro. of Painters' and Decorators' Union No. 3				200 00
Stonemasons' International Union No. 1 of Ontario				50 00
Int. Bro. of Brassworkers' Union, No. 23			225 00	
Typographical Union No. 91			780 00	750 00
Int. Builders' Laborers' Union				525 00
Local Assembly No. 2622, K. of L			225 00	
The *Globe* Employees' Benefit Society			60 00	164 00
The *Mail* Sick Benefit Association			35 00	
The Heintzman & Co. Employees' Benefit Society			131 28	
St. Lawrence Foundry Employees' Mutual Benefit Society			577 99	35 00
Woodstock—				
The Karn Employees' Mutual Benefit Association			140 75	

FINANCIAL STATEMENTS.

The Cobourg Car Works Friendly Society, Cobourg.

Amount collected from members:		Paid for sickness, accidents and death:	
1883-4	$600 55	1883-4	$527 00
1884-5	435 89	1884-5	269 16
1885-6	505 22	1885-6	566 28
1886-7	531 15	1886-7	691 74
1887-8	599 67	1887-8	606 30
1888-9	1,158 72	1888-9	1,232 00
1889-90	1,039 25	1889-90	996 59
1890-91	782 74	1890-91	735 21
1891-92	333 82	1891-92	308 00
		Balance, March 1st, 1892	64 73
Total	$5,997 01	Total	$5,997 01

About $150 of this amount was collected through excursions, concerts, etc.

About $300 of this amount was divided among the members in 1885. Since that time the revenue has been cut down to meet the expenses.

Typographical Union No. 204, Kingston.

Receipts for year 1891-92	$175 83
Expenditure " "	123 84

Iron Moulders' Union No. 136, Oshawa.

Financial condition fair, with about $400 in treasury.

Journeymen Tailors' Union of America, St. Thomas.

All debts paid and $50 to our credit in bank.

Cigar Makers' International Union No. 59, Brantford.

RECEIPTS—1892.

Initiation fees	$ 18 50
Dues	219 25
Semi-Annual assessment	16 50
Label assessment	4 25
Collected loans	63 00
Equalization from Unions 47, 51	132 38
Interest on money	9 03
Sundries	1 10
Balance on hand, Jan. 1st, 1892	146 34
Total	$610 35

EXPENDITURE.

Loans granted	$ 17 45
Sick benefit	145 00
Out-of-work benefit	16 50
Hall rent	12 00
Officers' salaries and committee expenses	24 00
Stationery	4 83
Labels	6 00
Postage	8 44
Label agitation expenses	4 99
Sundries	15 75
	$254 96
Balance on hand, Jan. 1st, 1893	$355 39
Total	$610 35

Cigar Makers' International Union No. 55, Hamilton.

RECEIPTS—1892.

Initiation fees	$ 29 00
Dues	617 40
Semi-annual assessment	50 50
Label assessment	10 75
Fines	3 40
Collected loans	151 90
Equalization from Union 46	235 79
Sundries	2 80
Returned benefit	10 82
Balance on hand Jan. 1st, 1892	565 53
Total	$1,677 89

EXPENDITURE.

Loans granted	$100 20
Sick benefit	250 40
Strike benefit	41 64
Out-of-work benefit	121 00
Death benefit	50 00
Hall rent	35 00
Officers' salaries and committee expenses	78 00
Stationery	13 90
Labels	15 00
Postage	16 13
Expenses of delegate	6 00
Sundries	2 25
Returned fines, etc	4 20
	$733 72
Balance on hand, Jan. 1st, 1893	944 17
Total	$1,677 89

Cigar Makers' International Union No. 140, St. Catharines.

RECEIPTS—1892.

Initiation fees	$ 6 00
Dues	83 50
Semi-annual assessment	9 00
Label assessment	2 25
Fines	14 00
Collected loans	9 15
Equalization from Union 97	52 35
Balance on hand, Jan. 1st, 1892	69 59
Total	$245 84

EXPENDITURE.

Loans granted	$24 00
Sick benefit	5 00
Out-of-work benefit	26 50
Hall rent	5 00
Officers' salaries and committee expenses	4 50
Stationery	2 45
Labels	4 50
Postage	4 05
	$ 76 00
Balance on hand, Jan. 1st, 1893	169 84
Total	$245 84

Cigar Makers' International Union No. 278, London.

RECEIPTS—1892.

Initiation fees	$103 00
Dues	776 25
Semi-annual assessment	65 50
Label assessment	13 50
Collected loans	142 80
Equalization from Unions 228, 231, 233, 234, 235, 245	480 53
Interest on money	6 72
Balance on hand, Jan. 1st, 1892	564 67
Total	$2,152 97

EXPENDITURE.

Loans granted	$157 75
Sick benefit	315 67
Strike benefit	12 50
Out-of-work benefit	49 00
Death benefit	50 00
Hall rent	49 00
Officers' salaries and committee expenses	80 20
Stationery	16 65
Labels	1 05
Postage	19 83

EXPENDITURE.—*Continued.*

Tax to Int. Union	$50 00
Label agitation expenses	5 00
Sundries	8 54
	$815 19
Balance in hand, Jan 1st, 1893	$1,337 78
Total	$2,152 97

Cigar Makers' International Union No. 27, Toronto.

RECEIPTS—1892.

Initiation fees	$ 83 50
Dues	1,600 05
Semi annual assessment	129 50
Label assessment	32 25
Fines	36 00
Collected loans	194 80
Equalization from Unions 38, 39	209 59
Sundries	10
Illegal expenditures	12 64
Balance on hand, Jan. 1, 1892	1,689 19
Total	$3,987 62

EXPENDITURE.

Loans granted	$ 168 40
Sick benefit	565 60
Strike benefit	9 82
Out of-work benefit	86 50
Death benefit	130 00
Hall rent	51 50
Officers' salaries and committee expenses	337 84
Stationery	5 60
Labels	20 00
Postage	10 75
Label agitation expenses	36 00
Duty on supplies	3 16
Sundries	11 99
	$1,437 16
Balance on hand, Jan. 1st, 1893	2,550 46
Total	$3,987 62

Cigar Makers' Unions of Ontario.

Ontario Cigar-makers. 1892.	Number of members.	Loans granted.	Out-of-work benefit.	Strike benefit.	Sick benefit.	Death benefit.	Total loans and benefits paid, 1892.	Total Expenditure 1892.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Brantford Union No. 59	17	17 45	16 50	.....	145 00	.....	178 95	254 96
Hamilton Union No. 55	55	100 20	121 00	41 64	250 40	50 00	563 24	733 72
St. Catharines Union No.140	11	24 00	26 50	.....	5 00	.....	55 50	76 00
London Union No. 278	78	157 75	49 00	12 50	315 67	50 00	584 92	815 19
Toronto Union No. 27	139	168 40	86 50	9 82	565 60	130 00	960 32	1,437 16
	300	467 80	299 50	63 96	1,281 67	230 00	2,342 93	3,817 03

Cigar Makers' International Union of America.

The Annual Financial report of the Cigar-makers' International Union of America for the year 1892, summarizes its business of the year—the total membership, not including travelling members, being 26,678—as follows:

RECEIPTS.

Initiation fees	$ 21,323 00
Dues (25 cent)	315,114 65
Dues (10 cent)	6,393 00
Semi-annual assessment	25,418 50
Label assessment	6,177 75
Fines	3,143 34
Collected loans	49,572 75
In aid of strikes	3,910 00
Equalization from unions	58,051 16
Assistance from unions	4,075 00
Interest on money	9,921 20
Due Int. Union per Financier's examination	1,921 99
Refunded illegal benefits	613 65
Deposited for use of label	50 00
Deficiencies collected of members	179 74
Income from various sources	409 12
Illegal expenditures	3,178 19
Due on old accounts	80 56
Balance on hand January 1, 1892	421,950 06
	$931,483 66

EXPENDITURE.

Assistance to travelling members	$47,732 47
Sick benefit	89,906 30
Strike benefit	37,477 60
Out-of-work benefit	17,460 75
Death benefit	44 701 97
Hall rent	11,067 67
Officers' salary and committee expenses	54,779 49
Stationery	5,284 62
Labels	5.492 30
Postage	4,086 99
Tax to International Union	15,550 00
Label assessment to International Union	228 50
Equalization to Unions	58,051 16
Label agitation expenses	5,004 51
Lawyers' fees in label and other cases	6,328 00
To unions on strike	3,910 00
Balance expenses due delegates	397 71
Assistance to unions	4,075 00
Returned money to International Union	2,783 04
Not accounted for through dissolved unions	378 87
Returned to tenement-house workers	4,671 51
To label and grievance committees	1,309 50
Loss through failure of bank	376 60
Returned label deposit	50 00
Returned money for dues, etc	259 31

EXPENDITURE.—*Continued.*

Office furniture for local unions	$ 731 65
Sundries	5,558 94
Balance on hand January 1, 1893	503,829 20
Total	$931,483 66

Loans outstanding	$58,924 46
Number of members January 1, 1893	26,678

The above does not include travelling members.

BENEFITS.

The following table presents the total benefits paid for the last fourteen years:

Year.	Strike benefit.	Sick benefit.	Death benefit.	Travelling benefit.	Out-of-work benefit.
1879	$ 3,668 23				
1880	4,950 36			$ 2,808 15	
1881	21,797 68	$ 3,987 73	$ 75 00	12,747 09	
1882	44,850 41	17,145 29	1,674 25	20,386 64	
1883	27,812 13	22,250 56	2,690 00	37,135 20	
1884	143,547 36	31,551 50	3,920 00	39,632 08	
1885	61,087 28	29,379 89	4,214 00	26,683 54	
1886	54,402 61	42,225 59	4,820 00	31,835 71	
1887	13,871 62	63,900 88	8,850 00	49,281 04	
1888	45,303 62	58,824 19	21,319 75	42,894 75	
1889	5,202 52	59,519 94	19,175 50	43,540 44	
1890	18,414 27	64,660 47	26,043 00	37,914 72	$ 22,760 50
1891	33,531 78	87,472 97	38,068 35	53,535 73	21,223 50
1892	37,477 60	89,906 30	44,701 97	47,732 47	17,460 75
Total	$515,917 47	$570,825 31	$175,551 82	$446,127 56	$61,444 75

Grand total of benefits paid	$1,769,866 91
Total benefits paid in 1892	237,279 09

United Brotherhood of Carpenters and Joiners, Local Union No. 194, London.

Funds in bank	$67 00
In hands of Treasurer	5 00
Invested in building	50 00
Total	$122 00

United Brotherhood of Carpenters and Joiners of America.

General Secretary-treasurer P. J. McGuire, of the United Brotherhood of Carpenters and Joiners of America, in his Biennial Report for the two years ending June 30th, 1892, after pointing out that the Association had, in that time, paid out no less than $23,650 as wife funeral benefits, contributes an abstract of the receipts and expenditure for the term mentioned, together with a statement of general benefits paid during the last ten years, as follows:

RECEIPTS.

From Charters and Capita Tax	$114,318 42
" Supplies, badges, etc.	26,204 55
" Advertisers	644 50
" Supplies to D. C. and Clearance	360 86
" Rent of part of office building	240 00
" Sub-tenants for gas used	51 00
" J. S. W. Saunders	78 40
" Special Assessment levied March 17, 1892	10,642 85
" Loan from Protective Fund	4,500 00
" Balance on hand July 1, 1890	5,986 22
Total	$163,026 80

EXPENDITURE.

For printing 24 issues of Journal and supplies	$12,313 45
" Wrapping and mailing 24 issues	947 94
" Postage on letters, supplies, etc.	1,859 09
" Expressage	897 07
" Office rent	600 00
" Telegrams	240 09
" Salaries and clerk hire	10,295 33
" Services of G. E. B.	2,884 83
" Services of General Treasurer	190 00
" American Federation of Labor	2,834 95
" Travelling and organizing	2,091 03
" General President's travelling expenses	111 60
" Investigations	225 25
" Lithographing Charters	142 56
" Badges and Charms	5,128 94
" Miscellaneous and incidentals	537 45
" Expenses of Chicago convention	1,273 91
" Coal, wood and light	136 00
" Stationery and supplies	358 08
" Translating	34 00
" Post office box rent	24 00
Total expenditure	$43,125 57
Loan repaid A. F. of L.	2,500 00
Benefits paid	117,346 00
Cash on hand July 1, 1892	55 23
Sum total	$163,026 80

AMOUNT OF GENERAL BENEFITS PAID.

Years.	No. of Benefits paid.	Amount paid.	Balance on hand.
1883	6	$ 1,500 00	
1884	9	2,250 00	$ 28 34
1885	36	5,700 00	228 02
1886	54	9,200 00	2,080 12
1887	139	16,275 16	3,333 55
1888	172	18,750 00	7,980 51
1889	224	25,575 00	6,535 65
1890	254	32,267 49	5,986 22
1891	374	44,732 65	8,232 51
1892	620	72,613 35	55 23
Total	1,888	$228,863 65	

The "Globe" Employees' Benefit Society, Toronto.

1891-92.	Balance from 1890-91		$323 17
"	Dues and initiations		233 65
"	Benefits paid	$224 00	
"	Doctors' fees, etc	67 45	
"	Cash on hand	265 37	
	Total	$556 82	$556 82
1892-93.	Balance from 1891-92		$265 37
	Dues, initiations and interest		273 60
	Benefits paid during the year	$82 50	
	Rebates	19 60	
	Doctors' fees, etc	19 60	
	Other expenditure	75 80	
	Cash on hand	341 47	
	Total	$538 97	$538 97

International Association of Machinists, Lodge 235, Toronto.

Total amount received from February 13th, 1892	$250 00
Total expenditure for the same time	156 00
Balance	$94 00

Brotherhood of Painters and Decorators, Local Union No. 3, Toronto

Cash on hand, December, 1891	$400 00

Stone Masons' International Union No. 1, of Ontario, Toronto.

Amount received in 1891 for initiation fees and monthly dues	$1.666 00

"Mail" Sick Benefit Association, Toronto.

Statement for half-year ending January 6th, 1893:

RECEIPTS.

Balance on hand July 2nd, 1892	$59 90
Received on account of dues for half-year	109 70
Interest on funds for 1892	2 88
	$172 48

DISBURSEMENTS.

Paid on account of sick benefits	$35 00
" " salaries	10 00
	$45 00

RECAPITULATION.

Receipts	$172 48
Disbursements	45 00
	$127 48

GENERAL REMARKS.

The Cobourg Car Works Friendly Society. The preamble to the constitution of this society is as follows: "So liable is man to sickness and misfortunes, that one of the most healthy and robust constitution could not for a single moment put himself in defiance of either. Conscious, therefore, of the various vicissitudes in life, and impressed with a desire to provide for unexpected sickness, accident or death, we agree in establishing a friendly society; and to protect it from the corroding influence of jealousy on the one hand, and imposition on the other, prudence and reflection point out the necessity of standing by the following general rules, as revised and amended in the year 1892. All former rules to be null and void." Among the general rules, Article VI. provides that "every person being an employee at the Cobourg Car Works will be considered eligible to become a member, irrespective of age, who is at the time of entry in good health and of strict moral character; and if it be afterwards found that a member was subject to any disease before he became connected with the society he shall be deprived of his status as a member, and declared to have forfeited all claims to any benefit from the society." . . . On joining, new members pay 25 cents towards fund maintenance. Apart from this all members pay from $\frac{1}{2}$ to $1\frac{1}{2}$ cents per working day as the funds require or the president deems necessary—the same to be taken out in the office the first pay day in each month. It is also provided that none of the funds of the society shall be used except for sick and funeral benefits, or any other urgent requirement of the society or in connection therewith. Under the head "Benefits" it is provided that "any member unable to follow his usual or any employment by sickness or accident, will, upon application to the secretary, be paid at the rate of 50 cents per working day for such time as he is sick—not exceeding six months, nor less than six days consecutively; and $25 shall be given the family of any deceased member, and the sum of $15 shall be given to a member on the death of the wife. It will be observed in the financial statement (given elsewhere herein) that the years run into each other. This is accounted for by the society organizing in March. This gives ten months of one year and two months of the succeeding year in each financial year of the society. The organization is a decided success as a benefit to the men in cases of sickness, accident or death. It was organized to do away with the subscription list system that is common in shops where no society exists, and which does so much harm to really deserving men, while the thriftless wallow in the proceeds. This system is much better and cheaper than the old one.

Typographical Union, Hamilton. The day workers labor 54 hours per week in summer, from May to October inclusive, and 58 hours per week during the other half of the year, at $10.50 per week. The "piece" hands get 30 cents per thousand ems, with six hours' continuous composition daily (this applies to newspapers). There is very little piece-work done outside of news work in the city. No type-setting machines have been in Hamilton yet.

Journeymen Tailors' Union, Hamilton. This organization has had a local existence for nearly twenty years, but in January last it was decided to join the International Union of Tailors as a subordinate body, and it is now Local Union No. 149 of the International body.

Trades and Labor Council, Hamilton. In the years '88 and '90 three delegates represented a subordinate organization, which rule was changed in 1891, making five delegates the limit. This increased the individual membership of the T. and L. Council, while the aggregate number of organizations has decreased. The work of the Council is purely legislative in its character. Local municipal matters, where the interests of labor

are affected, and any matter or subject having general effect upon the wage-earner, are within the jurisdiction of this Council. Trade matters, such as labor disputes, lockouts, strikes, etc., are only dealt with when appealed to, and then only having advisory power.

Iron Moulders' Union, Kingston. The Chown & Cunningham Company locked out our members the week before last Christmas, and as a consequence many of them have left the city. This company demanded that our members sign an agreement to pay for all damages through negligence or want of skill, wear and tear of flasks—everything to be decided between the employer and the foreman.

Legislation is urgently required in the following particulars, viz.: Prohibiting the importation of foreign labor to take the places of our own men and against the discharge of men because they beloug to labor organizations; obliging mechanics to produce cards or papers to indicate the serving of a requisite apprenticeship. Doctors and lawyers are required by law to conform to certain defined regulations, and like stipulations ought to exist as to mechanics before being allowed to follow vocations.

Typographical Union, Kingston. No. 204 is a subordinate union of the International Typographical Union of America, with about a total membership of 28,000 and headquarters in Indianapolis, Indiana, U. S. A.

Iron Moulders' Union, Ottawa. Statistics show that a moulder works but sixteen years at his trade, after which he is useless for work in a foundry.

Chaudiere Assembly No. 2966, K. of L., Ottawa. This Assembly is mainly composed of men employed in connection the lumber industry at Ottawa on one and Hull on the opposite side of the Ottawa River. The strike in the saw-mills and lumber yards in both cities in September, 1891, was not ordered by any organization—in fact there was very little organization among these men at that time; nor was the strike premeditated even. It originated as follows: Some men working on one of the mill platforms asked to have the reduction of 50 cents per week returned to them, but got no satisfaction from either foreman or mill-owner. After repeated efforts to secure this, on the claim that the firm was putting more work on them than they could stand—there being three less men than had formerly performed the same work—they decided that if they did not get it back on Monday, September 11th, 1891, they would cease work. Getting no satisfaction on that date, these nine or ten men ceased work and appealed to the men in the mill to stop with them until they got the advance. The mill men came out on strike also, when they were addressed by one of the mill-owners, who said it was not the fault of their firm that wages were reduced, but to go and get J. R. Booth to raise the wages and they would follow suit. The men then proceeded to Booth's and asked the men there to join them, which the latter did. It was then decided to ask all mill and yard men to join until justice had been done, and to demand ten hours as a day's work. By evening all work in the lumber industry was completely stopped. That evening the strikers decided to hand the matter over to the Knights of Labor and the Ottawa Trades and Labor Council to handle. All efforts to settle the matter were unavailing. *The mill-owners refused arbitration* and threatened to close up the mills for the season. A compromise was offered by the men, who asked that a quarter of an hour be taken off and that the fifty cents be added to their pay. The various clergymen of Ottawa and Hull, the two Mayors, members of Parliament and other public citizens visited the mill-owners in session, but these employers would not yield. The men were more than ever determined not to return at the old rate; and repeated efforts, backed up with police and militia, to open the mills for work proved unavailing. At last the mill-owners showed signs of yielding, Mason's mill being the first to open at the ten-hour day. Buell, Orr, Hurdman & Co. soon followed, and then came nearly all the lumber-forwarding firms. This left only the Messrs. Perley & Pattee, Bronson & Weston and J. R. Booth still holding out, but they in turn soon commenced to offer better terms and finally agreed to open the mills at $11\frac{1}{4}$ hours a day, and, owing to men being very scarce, were compelled to advance wages about from 10 to 12 per cent. for the balance of the season. The scarcity of suitable men was due to the fact that during the time of the strike most of the old employees had left the city and vicinity, seeking employment else-

where, and as a consequence the mills of the three firms above referred to were not, nor could they be, run in full during the reminder of that season. Thus the strike was declared off after a six weeks' struggle.

District Assembly, No. 6, Knights of Labor, Ottawa. This District is composed of all Assemblies of the K. of L. in the city of Ottawa, and in the counties of Carleton and Russell, in Ontario, and in the county of Ottawa, Province of Quebec. Having been but recently formed, it is impossible to give accurate data. The principal membership consists of lumbermen and ordinary laboring men.

Brotherhood of Carpenters and Joiners, St. Catharines. Union No. 38 was organized in the spring of 1883, at which time the wages were, on an average, $1.50 per day of 10 hours. Since organization, without resort to strike or lockout, we have reduced the working day to 9 hours, with an average wage of 22½ cents per hour. At the present it is extremely dull, but the time and wage remain the same, thanks to our organization. The shortening of the hours of labor is regarded by our members as of even greater benefit than the increased wage.

Amalgamated Society of Carpenters and Joiners, Branch No. 1, Toronto. The Society of which No. 1 is a branch) is composed of 563 branches and 36,487 members, located in England, Ireland, Scotland, Wales, United States, Canada, New Zealand, Australia and South Africa. Its balance sheet for 1891 shows an income for the year of $441,067.60, while the total expenditure was only $323,302.59, and a balance held in hand of $354,680.56, or $10.52 per head of members in December, 1891. The funds are equalized every three years by the General Office, the poor branches receiving from the wealthy ones; and if at any time the funds of any branch should run short through a trade dispute or other cause, they are replenished immediately by order of the general office, so that no dispute should fall through by reason of lack of funds. The Old Country members were benefited last year, through the superannuation fund, by $30,898.20, while the full amount paid through trade disputes was $77,520,60, out of which the London (England) members received $63,320.75 on account of a lockout which existed for some months.

Brotherhood of Carpenters and Joiners of America. Union 27, Toronto:

Average number of returns per month	12.66
Average number of hours per month per return	151
Average monthly wage	$36.37
Average number of dependents	2.90
Cost of living per month per return	$35.16

In submitting these figures we are satisfied that they may be considered as the maximum, for the rates given are far in excess of the well-known wages per hour, and the number of hours returned showed that it is the steadiest men who have made the returns. But this year both the time and the wages have dropped at least 20 per cent. from last year.

Brotherhood of Painters and Decorators of America, Local Union No. 3, Toronto: The cause of decrease in membership is the depression of trade and consequent numbers leaving to seek work elsewhere.

The "Globe" Employee' Benefit Association, Toronto. $4 per week benefits, and the services of a physician were paid during 1891-92; $5 per week and no doctors for 1892-93.

Typographical Union, No. 91, Toronto. The printing trade fluctuates, as is the case with most trades and callings, and some months in the year—especially the fall—we are fairly busy, but during the summer months there is a marked falling off, which necessitates our members seeking work elsewhere.

Local Assembly, No. 2622, K. of L., Toronto. The Government should make an investigation of the labor market at the present time if possible. It would cost a trifle to do this, perhaps, but it would end in a great deal of good. In this way would be cor-

rectly ascertained how the working classes are situated, for it is next to impossible to get a majority of the working people to sign any paper to send to your department. In this way, by a thorough canvass of workshops and industries information could be had that can never be had otherwise.

Wheatsheaf Assembly No. 3499, K. of L. (Bakers and Pastry Cooks), Toronto. The trade in general is very low. It is as bad now as it was in and from 1876 up to 1882, but we are increasing in number, and are living in hopes of bettering our condition by the beginning of next year. Last winter was the hardest seen in the trade, the average working hours in the trade being 14 per day for from $7 to $8 per week.

International Association of Machinists, Toronto. As this Association was only organized in February, 1892, we have had no strike or lockout up to date (November, 1892).

The Mail Sick Benefit Association, Toronto. For the maintenance of this institution members are assessed ten cents each weekly until a fund of $150 has accumulated, when the assessment ceases until such time as a call has been made on the treasury, when the collection of the assessment is resumed. The membership is confined strictly to employees of the *Mail* composing room alone, and consequently there is but little room for an increase in the membership. Were we to open our jurisdiction to other departments of the *Mail* building our membership would undoubtedly be materially increased, but the scheme was inaugurated as a private undertaking amongst the compositors themselves. In this respect we differ from the *Globe* Society, in that they admit to membership employees in all departments of their building.

The Karn Employees' Mutual Benefit Association, Woodstock. Have issued no financial statement in printed form. The object is to furnish members (men and boys working in the factory being the only members) with a sick and accident benefit at the cheapest rate. The association furnishes medical attendance, and medicine as well as the financial help, for 25 cents per month. The funds are constantly growing and satisfactory. The entrance fee is only 75 cents.

Massey-Harris Employees' Mutual Benefit Association, Woodstock. As the society has only recently been started, no benefits have been paid to date, but provision is made in cases of sickness and of death. In case of sickness each member in good standing earning $1 or over will receive 50 cents per day; earning under $1, 25 cents a day. On the death of a member earning over $1, $40 are payable; under $1, $20. Half this amount is payable on death of a member's wife, and $15 at death of child under 15 years of age. All employees are members of the organization.

STRIKES AND LOCKOUTS.

In order to obtain information in regard to strikes and lockouts in Ontario, the following circular was sent out in August, 1892, to labor organizations, employers of labor and labor correspondents in all parts of the Province:

TORONTO, August 15th, 1892.

The persons to whom sent, whether employers or employees, will please fill in this schedule and return the same in enclosed envelope (postage free if unsealed) on or before September 15th.

C. C. JAMES,
Secretary.

Return of..... ... .
(Indicate whether strike or lockout is here reported upon.)

STRIKES AND LOCKOUTS.

1.—Time of beginning and ending, including and since 1888, to date.
2.—Location and nature of Industry affected—
3.—Number of establishments and of persons directly affected—
4.—Cause or object—
5.—How started (by order of organization or otherwise)?—
6.—Result—whether successful or unsuccessful—
7.—Total strike allowance paid, if any—
8.—Loss occasioned employees—
9.—Loss occasioned employers—
10.—Any other information connected therewith—

Name of firm, organization or person making return.

Post office address.

One hundred and seventy-eight returns were received in reply to the above schedule, dated August 15, 1892, respecting strikes and lockouts, and were from all sections of the province, including Almonte, Alvinston, Arthur, Arnprior, Aurora, Barrie, Berlin, Bowmanville, Brantford, Brockville, Brussels, Carleton Place, Chatham, Chesley, Clinton, Cobourg, Cornwall, Delhi, Deseronto, Doon, Dundas, Dutton, Dunnville, Fenelon Falls, Gananoque, Galt, Garden Island, Georgetown, Goderich, Guelph, Hamilton, Hanover, Hawkesbury, Hespeler, Ingersoll, Keewatin, Kincardine, Kingston, Kingsville, Lakeport, Lancaster, Lindsay, Lisle, Listowel, London, Madoc, Mount Forest, Napanee, Newburgh, New Hamburg, Newmarket, Norwood, Orillia, Oshawa, Ottawa, Owen Sound, Peterborough, Plattsville, Paris, Perth, Preston, Smith's Falls, St. Catharines, Stratford, Toronto and Woodstock. Of these returns 28 were on behalf of labor organizations, 5 from labor correspondents, and 145 were by employers of labor.

The returns thus received gave reports of 22 strikes and 5 lockouts in Ontario from January 1st, 1888, to December 31st, 1892. The strikes took place as follows: 2 in 1888, 11 in 1889, 2 in 1890, 3 in 1891 and 4 in 1892. The following is the statement of results as reported to us:

Successful	8
Unsuccessful	6
Settled by compromise	3
Settled by agreement	1
Settled through conciliation	1
Still undecided	1
Doubtful	1
Firm failed and assigned	1

The strikes by trades were as follows:

Bakers	1889
Cigar Makers	1888, 1891, 1892
Cotton Weavers	1889
Cotton mill employees	1889
Furniture factory employees	1889
Iron Moulders	1889, 1890, 1892
Lockworks' employees	1889
Painters and Decorators	1888
Plasterers' laborers	1889
Riveters	1889
Stone-cutters	1890
Stone-masons	1890
Saw mill operatives	1891
Tailors	1889, 1890, 1891
Typographical Union	1892

The lockouts occurred as follows: 1 in 1888, 1 in 1889, 2 in 1890, and 1 in 1891.

STRIKES AND LOCKOUTS—RETURNS BY EMPLOYEES.

Location and Nature of Industry.	Time of beginning and ending, including and since 1888.		Establishments and persons directly affected.		Result.	Loss to Employee.	Loss to Employer.	Strike allowance paid.
STRIKES.	From	To	Establishments.	Persons.				
			No.	No.		$ c.	$ c.	$ c.
Brantford :								
Cigar Makers' Union	April 17, 1888..	May 26, 1888..	2	17	Unsuccessful	160 00		265 25
Tailors' Union	April 9, 1890..	April 11, 1890..	9	18	Successful			
Cornwall :								
Cotton Weavers	1889..	Out five weeks	1	500	Settled by agreement	1,500 00		
Galt :								
Iron Moulders' Union	June 8, 1889..	March 1890.	4	525	Unsuccessful			
Hamilton :								
Iron Moulders' Union	Sept , 1890..	April, 1890..	1		Doubtful			
Iron Moulders' Union	Feb. 1892..	November, 1892..	6		Still undecided			19,000 00
Cigar Makers' Union	July 1, 1892..	July 8, 1892..	11	42	Successful	None.	None.	225 00
Kingston :								
Iron Moulders' Union	Jan. 1, 1892..	August 15, 1892..	1	20	*Unsuccessful			
Listowel :								
Furniture factory employees	June 15, 1889..	About Sept. 30, 1892..	1	122	Firm assigned			
London :								
Cigar Makers' Union	April 7, 1891..	May 30, 1891..	6	18	Unsuccessful			
Tailors' Union	1889..	Two days, 1889..			Successful			
Merritton :								
Cotton mill employees	1889..	One week, 1889..	1	75	Compromised	500 00		
Ottawa :								
Tailors' Union	April 7, 1891..	April 24, 1891..	9	35	Successful	350 00		195 00
Typographical Union	Nov. 9, 1892..	November 10, 1892..	1	9	Successful			
Saw mill and lumber yard employees	Sept. 12, 1891..	November 1, 1891..	9	2,400	Successful	75,000 00	350,000 00	1,500 00

Owen Sound :										
Riveters		1889	About 21 days,	1889	1	50	Settled by conciliation	1,000 00		
Peterborough :										
Lock Works' employees		1889	A few days,	1889	1	20	Compromised			
Toronto :										
Painters and Decorators' Union	May 7,	1888	May 23,	1888			Successful			200 00
Stone Masons' Union	April 1,	1890	June 12,	1890	100	260	Successful	25,075 00		250 00
Bakers' Union		1889	Two weeks,	1889		200	Unsuccessful			
Stone Cutters' Union		1889		1889		16	Undecided			
Plasterers' Laborers' Union		1889	Nine days,	1889		200	Compromised	358 00		
Iron Moulders' Union		1889		1889						
LOCKOUTS.										
Toronto :										
E. & C. Gurney's Shop Moulders	Feb. 24,	1890	May 28,	1891	1	35	Successful			3,082 00
H. A. Massey & Son, moulders in agricultural shop	Oct. 11,	1890	July 10,	1891	1	8	Successful			1,000 00
R. J. Hovenden, Painters	Nov. 6,	1891	Still out		1	8	Still undecided			140 00
Daily Newspaper		1888	May,	1890	1	20	Successful			†
Employing Custom Shoemakers	March,	1889			1		Successful	500 00		250 00

* Unsuccessful in gaining a union shop, but the firm did away with the agreement and raised wages from $1.85 a day to $2 per day.
† Paid married men $7 and single men $5 per week until they found employment.

STRIKES AND LOCKOUTS—RETURNS BY EMPLOYERS.

Location and Nature of Industry.	Time of beginning and ending, including and since 1888.		Number of establishments and of persons directly affected.		Results.	Loss to Employers.	Loss to Employees.	Strike allowance paid.
	From	To	Establishments.	Persons.		$ c.	$ c.	$ c.
Galt:								
MacGregor, Gourlay & Co., (foundry) strike.	July 6, 1889..	May, 1890..	5	40	Unsuccessful.....	.....	.....	.....
Hamilton:								
Sawyer & Massey Co., (ironmoulders)	Dec. 1890..	July, 1891..	1	15	Unsuccessful.....	.....	.....	.....
Hanover:								
Knechtel Furniture Co., (strike).....	March 1, 1891..	One day, 1891..	1	50	Uusuccessful.....	.....	.....	.....
Ottawa:								
R. W. Shannon, (publisher) lockout	March 29, 1892..	.....	1	10	Successful.....	100 00	.....	.....
do do (strike).....	Nov. 9, 1892..	One day, 1892..	1	10	Successful.....	.....	.....	.....
Bronson & Weston Lumber Co., (strike)....	Sept. 14, 1891..	October 10, 1891 .	1	500	Unsuccessful.....	.....	20,000 00	.....
J. R. Booth, lumber, (strike).....	Sept. 1891..	October 1891..	1	700	Unsuccessful.....	.....	.....	None.
Pattee & Perley, lumber mills (strike).....	Sept. 14, 1891..	October 12, 1891..	*5	351	Partly successful.....	Nominal.	11,304 40	None.
Buell, Orr & Hardman Co., lumber (strike)...	Sept. 5, 1891..	October 16, 1891..	†5	300	Partly successful.....	.....	150,000 00	.....
Ayr:								
Watson M'f'g Co., agricultural imp., (strike).	Feb. 16, 1889..	April 1, 1889..	1	26	Unsuccessful.....	Little loss.	.....	.....
Berlin:								
Laborers on sewer (strike).....	One day, 1891..	One day, 1891..	Corporation	18	Unsuccessful.....	.....	.....	.....

*Note—Includes the two firms immediately preceding, as also the number of persons. † In the strike in the Ottawa lumber mills five firms only were concerned.

PARTICULARS OF STRIKES AND LOCKOUTS—RETURNS BY EMPLOYERS.

AYR.

Watson Manufacturing Co. Limited. Strike—1. Time of beginning and ending: From February 16th to April 1st, 1889. 2. Location and nature of industry affected: Ayr, Ont.; agricultural implements. 3. Number of establishments and of persons directly affected: One establishment and twenty-six moulders. 4. Cause or object: Moulders all struck because we would not discharge foreman moulder who was not a union moulder. 5. How started (by order of organization or otherwise): By order of union. 6. Result, whether successful or unsuccessful: Strike was not successful, as every moulder was discharged and paid off within one hour after strike, and strikers ordered off premises, and not recognized in any way afterwards. 7. Total strike allowance paid, if any: International union paid the men the regular allowance of $5 per week to single men and $7 to married men. 8. Loss occasioned employees: Total loss, as far as the moulders were concerned. They all lost their jobs and cannot work here again at all, and all had to leave the town, not one remaining. 9. Loss occasioned employers: Seven weeks' inconvenience but not much loss, as we had special police protection for new men and kept shop open.

BERLIN.

Brown & Erb, Upholsterers, etc. We have had no strikes here amounting to anything, only that some eighteen men (laborers) quit work on town sewer. Two agitators got it up. The other men went to work again within twenty-four hours. The leaders applied for work again but were not taken on. Town pays $1.10 for ten hours, and best men get from $1.25 to $3 per day.

DUNDAS.

For the Dundas Stove Co. This Company has been out of business since 1888. Closed up owing to the difficulty with the workmen during the moulders' strike in the city of Hamilton. While the strike was on in Hamilton the union allowed men to work in Dundas at the prices they were paying, and when the strike was settled the Hamilton employers (it was alleged) were to give a further advance of 10 per cent. in the spring. So the men employed by the Dundas Stove Company asked for the same advance, which was refused on the ground that the prices were right or the union would not have allowed the Hamilton men the privilege of working in Dundas, and the Company closed down and quit the business.

GALT.

MacGregor, Gourlay & Co., Machinists. Strike in moulding shop. 1. Time of beginning and ending, including and since 1888 to date: From July 6th, 1889, to May, 1890. 2. Location and nature of industry affected: Galt, Ont.; moulding shop. 3. Number of establishments and persons directly affected: Five establishments; about forty persons. 4. Cause or object: A minimum wage and increased pay. 5. How started (by order of organization or otherwise): By order of organization. 6. Result, whether successful or unsuccessful: Unsuccessful in every respect.

HAMILTON.

Sawyer & Massey, Agricultural Implements. Strike—1. Time of beginning and ending: From December, 1890, to July, 1891. 2. Location and nature of industry affected: Moulders in connection with Sawyer & Massey Co., Hamilton, Ont. 3. Number of establishments and of persons directly affected: about fifteen persons. 4. Cause or object: In sympathy with strike at Massey works, Toronto. The men supposed we were doing work for the Toronto firm. 5. How started (by order of organization or otherwise): By order of organization. 6. Unsuccessful; we succeeded in getting all the men we

wanted. 9. Loss occasioned employers: Comparatively nothing, merely temporary inconvenience. 10. Any other information connected therewith: We are seldom troubled with strikes, as our shop is non-union, although we employ a little over 200 men. Do not object to men who belong to unions, but never ask whether they do or do not, and never yield to strikes.

HANOVER.

Knechtel Furniture Co. Strike—1. Time of beginning and ending: One day, March 1st, 1891. 2. Location and nature of industry affected: Hanover, Ont; furniture manufactory. 3. Number of establishments and of persons directly affected: One establishment; only about fifty of our employees went out. 4. Cause or object: To expel one of our employees who had made himself obnoxious to the rest. We refused to discharge the man, and a strike lasting a day was the consequence. All came back next day excepting a few whom we had dismissed for being ring-leaders. No organization here. 6. Result, whether successful or unsuccessful: Strike, from employees' standpoint, unsuccessful.

OTTAWA.

R. W. Shannon. Lockout—1. Time of beginning and ending: On March 29th, 1892. 2. Location and nature of industry affected: Ottawa *Citizen* newspaper. 3. Number of establishments and of persons directly affected: One establishment; ten employees. 4. Cause or object: To get rid of the Typographical Union. 6. Result, whether successful or unsuccessful: Successful. Loss occasioned employers: $100.

The Bronsons & Weston Lumber Co. Strike—1. Time of beginning and ending: From September 14, 1891, to October 10th, 1891. 2. Location and nature of industry affected: Ottawa; manufacture of lumber. 3. Number of establishments and of persons directly affected: About 500 persons. 4. Cause or object: Shorter hours and increased wages. 5. How started (by order of organization or otherwise): Apparently by the men themselves. 6. Results, whether successful or unsuccessful: Men went back to work on old terms. 8. Loss occasioned employees: $20,000.

J. R. Booth. Strike—1. Time of beginning and ending: About from last of September to about first week in October, 1891. 2. Location and nature of industry affected: Ottawa; lumber. 3. Number of establishments and of persons directly affected: About 700 persons. 4. Cause or object: Increase of wages and shorter hours. 5. How started (by order of organization or otherwise): By walking agitators. 6. Results, whether successful or unsuccessful: Unsuccessful. 7. Total strike allowance paid, if any: None.

Perley & Pattee. Strike—1. Time of beginning and ending: From September 14th to October 12th, 1891. 2. Location and nature of industry affected: Ottawa and Hull. 3. Number of establishments and of persons directly affected: Five establishments and about 1,800 men and boys. 4. Cause or object: To raise wages and shorten hours. 5. Result, whether successful or unsuccessful: Successful as to hours in the two smaller establishments. 7. Total strike allowance paid, if any: None. 8. Loss occasioned employees: We had 351 men and boys directly affected by the strike; they were idle for four weeks, and their wages for that time would have been $11,304 41. 9. Loss occasioned employers: nominal. 10. Any other information connected therewith: We think strike was largely fomented by a few leaders, but not by the regular leaders.

Buell, Orr, Hurdman & Co. Strike—1. Time of beginning and ending: From September 5th to October 16th, 1891. 2. Location and nature of industry affected: Ottawa; lumber manufacturing. 3. Number of establishments and of persons affected: Five establishments and probably 3,000 workmen; of these our firm employed 300, and probably 200 more were affected through our business being stopped. 4. Cause or object: More pay and shorter hours. 5. How started (by order of organization or otherwise): By order of Knights of Labor. 6. Result, whether successful or unsuccessful: Partly successful. 8. Loss occasioned employees: $150,000.

R. W. Shannon. Strike—1. Time of beginning and ending: Began on the 9th of of November, 1892, and ended on the evening of the same date. 2. Location and nature of industry affected: Ottawa; *Citizen* daily newspaper. 3. Number of establishments and of persons directly affected: One establishment, and seven men and three boys. 4. Cause or object: To secure employment of union men. 5. How started (by order of organization or otherwise): By Typographical Union. 6. Results, whether successful or unsuccessful: Successful, but there was no change in the terms upon which the men are employed other than this.

PARTICULARS OF STRIKES AND LOCKOUTS—RETURNS BY ORGANIZATIONS.

BRANTFORD.

Journeymen Tailors' Union. Strike—1. Time of beginning and ending: From April 9th to April 10th, 1890. 2. Location and nature of industry: Brantford; journeymen tailors. 3. Number of establishments and of persons affected: Establishments, 9; number of tailors who went out, 18. 4. Cause or object: Advance in wages. 5. How started (by order of organization or otherwise): By organization. 6. Result, whether successful or unsuccessful: Successful. 8. Loss occasioned employers: One day.

Cigar Makers' Union. Strike—1. Time of beginning and ending: From April 17th to May 26th, 1888, and from November 10th, 1888, to June 1st, 1889. 2. Location and nature of industry affected: Paris and Preston; cigar-making. 3 Number of establishments and of persons directly affected: Two establishments and 17 employees. 4. Cause or object: Against a reduction of wages. 5. How started (by organization or otherwise): Authorized by organization. 6. Result, whether successful or unsuccessful: Unsuccessful. 7. Total strike allowance paid, if any: $264 25. 8. Loss occasioned employees: $650. 10 Any other information connected therewith: Both firms, through loss of capital and trade, were unable to open up with more than one-fourth of their number of hands prior to the strike, and have since dissolved.

GALT.

By Labor Correspondent as to Ironmoulders' strike. 1. Time of beginning and ending: From June 8th, 1889, to March, 1890. 2. Location and nature of industry affected: Galt; iron works. 3. Number of establishments and of persons directly affected: Five establishments, and about 32 persons. 4. Cause or object: To raise wages and to have the shops run on union principles. 5. How started (by order of organization or otherwise): By Galt Moulders' Union. 6. Result, whether successful or unsuccessful: Unsuccessful. 7. Total strike allowance paid, if any: $2,000 by Moulders' Union, allowance to strikers, and $1,500 given to them by neighboring societies. 8. Loss occasioned employees: cannot get any correct information on this point. 9. Loss occasioned employers: Can't tell; employers say they don't know. 10 Any other information connected therewith: As the men engaged in the strike have all left here and are scattered all over, it was difficult to secure the desired information accurately.

HAMILTON.

Iron Moulders' Union. Strike—1. Time of beginning and ending: From September, 1890, to April, 1891. 2. Location and nature of industry affected: Hamilton; iron moulding. 3. Number of establishments and of persons directly affected: One establishment—Sawyer & Massey. 4. Cause or object: The firm wanted the moulders to make work on which there was a strike in the firm in Toronto, but which the moulders refused to do. 5. How started (by order of organization or otherwise): By order of the organization, to maintain the constitution. 6. Result, whether successful or unsuccessful: Doubtful result. 7. Total strike allowance paid, if any: Eleven hundred dollars. 8. Loss occasioned employees: Very small, if any. 9. Loss occasioned employers: Very large, but not in a position to give figures.

Iron Moulders' Union. Strike—1. Time of beginning and ending: From February to November, 1892. 2. Location and nature of industry affected; Hamilton; iron moulding. 3. Number of establishments and of persons directly affected: Six iron foundries. Cause or object: Attempt on the part of the employers to reduce wages, supplemented by an effort to break up the organization. 5. How started: By order of organization. 6. Result, whether successful or unsuccessful: Still undecided. Total strike allowance paid, if any: $19,000. Loss occasioned employees: Very large to the employees and the city. 9. Loss occasioned employers: Very large and cannot be estimated in figures. 10. Any information connected therewith: One of the six shops that commenced the trouble is running with union men at union rates, and employing about 20 men. One hundred and seventy-five union men were involved at the commencement of the strike. Of these, all being members of the Iron Moulders' Union, about twenty-six are left in this city, besides about forty who have secured work in other shops here not affected by the strike. The others are working mostly in the United States, while a few are employed in other parts of Canada.

Cigar Makers' Union. Strike—1. Time of beginning and ending: From July 1st to July 8th, 1892. 2. Location and nature of industry affected: Hamilton; cigar factories. 3. Number of establishments and of persons directly affected: Eleven factories; forty-five hands. 4. Cause or object: Low wages, increase of pay 5. How started (by order of organization or otherwise): By order of Cigar-makers' International Union of America. 6. Result, whether successful or unsuccessful: Successful. 7. Total strike allowance paid, if any: $220. 8. Loss occasioned employees: Very little, if any. 9. Loss occasioned employers: hardly any.

KINGSTON.

Iron Moulders' Union. Strike—1. Time of beginning and ending: From January 1st to August 15th 1892. 2. Location and nature of industry: Kingston; stove manufactory. 3. Number of establishments and of persons directly affected: One establishment; twenty moulders directly affected. 4. Cause or object: Trying to compel our members to sign an agreement and also trying to compel us to leave our union, as the company do not think a man has any right to say what he will make a piece of moulding for—only take just what the company determine to pay. 5. How started (by order of the organization or otherwise): This strike was ordered by our International Union and the members sustained throughout; that is, our members were not allowed to sign the agreement. 6. Result, whether successful or unsuccessful: Unsuccessful in gaining a union shop, but the firm did away with the agreement and raised the wages from $1.88 per day to $2 per day as a result of the fight. 8. Loss occasioned employees: Was the difference between $7 per week and what the men were able to make working piece-work, say $10, $11, $12 or $13 per week, a reduction of about $4.50 per week. 9. Loss occasioned employers: We suppose the loss was heavy, as the firm had to pay from $2.50 to $3 per day and stand the loss of about half of the castings; we do not know the exact cost, but the company did not want any more fights.

LONDON.

Cigar Makers' Union. Lockout—1. Time of beginning and ending: From April 7th to May 30th, 1891. 2. Location and nature of industry affected: London; cigar making. 3. Number of establishments and of persons directly affected: Six or seven; employees, eighteen. 4. Cause or object: To break up the union. 5. How started (by order of organization or otherwise): By order of the manufacturers who are formed in combination under bonds to each other. 6. Result, whether successful or unsuccessful: Defeat of manufacturers. 7. Total strike allowance paid, if any: $142. 8. Loss occasioned employees: About $2 each, weekly. 9. Loss occasioned employers: None.

OTTAWA.

Journeymen Tailors' Union. Strike—1. Time of beginning and ending: From April 10th to April 24th, 1891. 2. Location and nature of industry affected: Ottawa; tailoring—coat-making only. Number of establishments and of persons directly affected: Nine shops and thirty-five persons. 4. Cause or object: Increase of wages. 5. How started (by order of organization or otherwise): By order of the union. 6. Result, whether successful or unsuccessful: Successful. 7. Total strike allowance paid, if any: $195. 8. Loss occasioned employees: About $10 per member engaged. 9. Loss occasioned employers: What arose through disappointing customers for a time. 10. Any other information connected therewith: There were nine shops affected by the strike; of these five conceded the demand. These five, being among the largest stores, and employing a larger number of hands than the others, were probably more directly and more sensibly affected. Some of the men in the other shops, where the bosses did not sign the "bill," were out for five or six weeks; the average loss did not exceed $10. The increase in wages was about 10 per cent.

Chaudiere Assembly No. 2966 (mixed), K. of L. Strike—1. Time of beginning and ending: From September 12th to about November 1st, 1891. 2. Location and nature of industry affected: Cities of Ottawa and Hull; saw mills and lumber yards. 3. Number of establishments and of persons directly affected: Nine establishments and about 2,400 persons, men and boys. 4. Cause or object: Against a reduction of 50 cents per week in wages, and long working hours—the hours being $11\frac{3}{4}$ per day. 5. How started (by order of organization or otherwise): Not ordered by any organization—in fact, there was very little organization among the men so employed at the time, nor was the strike premeditated even. 6. Result, whether successful or unsuccessful: Successful, considering the first demand was only for the 50 cents advance per week. The men secured the 50 cents and a general increase of pay as well, besides securing a reduction of working time. 7. Total strike allowance paid, if any: The amount paid out in cash was about $1,500; apart from this sum the citizens of Ottawa and Hull contributed hundreds of dollars worth of provisions, etc., which were distributed to the men. 8. Loss occasioned employees: Estimated at about $75,000, which was partially offset by the support received while out on strike. 9. Loss occasioned employers: We have no means of giving an accurate estimate. Taking account of clerks and other office help, idle horses, teamsters, etc., boom men, shipping clerks, upper Ottawa works, non-fulfilment of orders and non-production, would represent at least an average loss to each firm of $300 per day, and it will be within the mark to estimate the employers' total loss at $350,000.

TORONTO.

Iron Moulders' Union. Lockouts—1. Time of beginning and ending: (*a.*) From February 24th, 1890, to May 28th, 1891; (*b.*) From October 11th, 1890, to July 18th, 1891. 2. Location and nature of industry affected: Toronto; (*a.* and *b.*) Moulding of stoves, heaters and agricultural implements. 3. Number of establishments and of persons directly affected: (*a.*) One establishment (E. & C. Gurney & Co.) and 35 moulders, 21 married and 14 single men; (*b.*) One establishment (H. A. Massey & Son) and 8 moulders, 6 married and 2 single men. 4. Cause or object: (*a.*) Introduction of piece-work on radiator jobs, and boy labor; (*b.*) Reduction of wages and introduction of boy labor. 5. How started (by order of organization or otherwise): (*a.* and *b.*) By the demand of the firms. 6. Results, whether successful or unsuccessful: (*a.* and *b.*) Unsuccessful. 7. Total strike allowance, if any: (*a.*) $3,082, and (*b.*) $1,000. 8. Loss occasioned employees: impossible to state with any degree of accuracy, and the same remarks apply also to the next following question (9.) 10. Any other information connected therewith: As to the number of moulders said to have been directly affected in answer 3, it might be stated that these men were actually in receipt of strike pay; the remainder in both cases had either left the city or secured jobs in the other shops. Gurney's shop, when running full, employed between 60 and 70 men. Massey employed about 50 men. Boy labor in answer 4 means the placing of a boy to work with a man, the latter paying his (the boy's) wages out of their joint earnings by

piece-work, and the man standing all losses, whether through his own fault or the carelessness and inexperience of the boy. The total cost of both conflicts to the organization was about $10,000. The number in receipt of strike pay constantly diminished as the men secured other situations, so that, in each, when the lockout was declared off, only two remained on the list.

Brotherhood of Painters and Decorators' Union No. 3. General strike—1. Time of beginning and ending: From May 1st to May 23rd, 1888; lockout, from November 6th, 1891, and still out. 2. Location and nature of industry affected: Toronto; painting. 3. Number of establishments and of persons directly affected: In general strike, employers and employees affected; in lockout, one employer (R. J. Hovenden) and eight employees. 4. Cause or object: In general strike, shorter hours and an increase of wages; in lock-out, decrease in pay. 5. How started (by order of organization or otherwise): organization. 6. Results, whether successful or unsuccessful: General strike, successful; lockout, not settled. 7. Total strike allowance paid, if any: In general strike, $200; in lockout, $140. 8. Loss occasioned employees: Eight weeks' work. 10. Any other information connected therewith: In case of lockout, wanting to reduce the wages of employees 2½ cents per hour.

Typographical Union No. 91. Lock-out—1. Time of beginning and ending: From July, 1888, to May, 1890. 2. Location and nature of industry affected: Toronto; daily journal. 3. Number of establishments and of persons directly affected: One establishment and about twenty persons. 4. Cause or object: A difference of opinion in regard to advertisements. 5. How started (by order of organization or otherwise): The employees were locked out. 6. Results, whether successful or unsuccessful: After the lapse of about two years, and with persistent effort on the part of the union, we were successful in the end. 7. Total allowance paid, if any: Married men, $7 per week; single men, $5 per week. 8. Loss occasioned employees: Hard to say, and the same answer applies to loss occasioned employers.

Stone Masons' Union No. 1, of Ontario. Strike—1. Time of beginning and ending: From April 1st to June 12th, 1890. 2. Location and nature of industry affected: Toronto; building trades. 3. Number of establishments and of persons directly affected: 70 contractors, 30 stone dealers, and 260 stonemasons. 4. Cause or object: An increase of wages demanded. 5. How started (by order of organization or otherwise): By order of Stone Masons' Union. 6. Results, whether successful or unsuccessful: Successful, an increase of 31½ cents per day being gained, making wages 36 cents per hour for five years from May 1st, 1890. 7. Total strike allowance paid, if any: $3,204.50. 8. Loss occasioned employees: $250.75. 10. Any other information connected therewith: An average of 50 per cent. of the members of the Union worked during the whole time of the strike, receiving the wages demanded from contractors who were not connected with the Builders' Exchange. From those working a strike tax of 5 cents per hour was collected, amounting to $10.66. The sum of $166 was also paid to members, for railway fares, who left the city and remained away until the trouble was over.

District Assembly No. 125, Knights of Labor. Lockout—1. Time of beginning and ending: From March, 1889 to present time. 2. Location and nature of industry affected: Toronto; custom shoemaking. Number of establishments and of persons affected: One establishment. 4. Cause or object: 25 per cent. reduction in wages. 5. How started (by order of organization or otherwise): By action of employer. 6. Results, whether successful or unsuccessful: Successful, in as far as the employer is concerned, as none of the men locked out have returned to his employment. 7. Total strike allowance paid, if any: About $250. 8. Loss occasioned employees: Say about $500. 9. Loss occasioned employer: Indications are many times the above amount. 10. Any other information connected therewith: The object of the firm concerned was, in brief, a movement to produce an article *apparently hand made*, at a slight reduction in price, but really a *quasi* machine-made article, much inferior in quality, the employee to be the greater sufferer in the difference in cost of production.

International Builders Laborers' Union. Strike—1. Time of beginning and ending: From April 8th to June 7th, 1890. 2. Location and nature of industry affected: Tor-

onto ; building operations. 3. Number of establishments and of persons directly affected : Brickmakers, bricklayers, masons, hod-carriers, carpenters, teamsters, hardware merchants, in fact, any industry interested in the building trade. 4. Cause or object: Request for an increase of two cents per hour, which was refused ; also, a refusal on the part of employers to recognize the union as a body and declining to enter into any further agreements with that organization, which had been the custom each year prior to 1893. 5. How started (by order of organization or otherwise) : By order of organization. 6. Result, whether successful or unsuccessful : Partly successful. 7. Total strike allowance paid, if any : $10,400.30, paid out as follows—eight weeks of the nine during which the strike continued married men received $5 per week and single men were paid $3 per week. 8. Loss occasioned employees : Nine weeks' work. 9. Loss occasioned employers : Cannot estimate the loss sustained by employers on that occasion but must have been enormous in the aggregate. 10. Any other information connected therewith : Although at the time the strike was ordered the employers declared most positively that the Builders' Exchange would enter into no more agreements, yet after a bitter struggle of nine weeks an agreement was agreed to, to cover a period of five years, that is to say, for the first two years an increase of one cent per hour would be paid and for the three following years the increase would be two cents per hour.

General Remarks from Returns by Employers.

Almonte.

Almonte Knitting Co. : Not any.
Rosamond Woollen Co. : Never had either a strike or a lockout.

Alvinston.

E. Warren & Son, Manufacturers of Woollens : We have never been troubled with strikes or lockouts.

Arthur.

John H. Quirt, Founder : There has been neither a strike nor a lockout here for the past thirty years.

Arnprior.

B. V. Stafford, Furniture Manufacturer, etc. : Have been employing a large number of men for the last twenty years, and have not had a strike or lockout in all these years.

McLachlin Bros., Lumber Mills : Never had a strike or lockout, or any trouble of that kind, although in business before and ever since the year 1888.

Aurora.

J. Fleury's Sons, Manufacturers of Agricultural Implements : No strikes or lockouts.

Neilly & Bell, Agricultural Implements : There have been no strikes or lockouts in this town.

Barrie.

Labor Correspondent : We have not had any strike or lockout in Barrie during the years referred to—1888-92.

BERLIN.

D. Hibner & Co., Furniture Manufacturers: Have had no strikes or lockouts during the period since 1888.

H. Krug, Furniture Manufacturer: No strikes or lockouts have occurred in my factory during the period mentioned

Felt Boot Company: We had no strike or lockout.

BOWMANVILLE.

Dominion Organ Co.: No strikes or lockouts have ever occurred with this company.

BRANTFORD.

H. B. Gardner, Cigar Manufacturer: We have no strike in this city, nor has there been any since 1888.

Typographical Union, No. 273: Neither strikes nor lockouts since 1888.

Cockshutt Plow Co.: Never had any trouble whatever.

BROCKVILLE.

The J. W. Mann Mfg. Co., (Agricultural Implements): Have never had any strikes or lockouts.

The James Smart Mfg. Co., (Hardware): We are pleased to say we have had no labor trouble during the years indicated.

BRUSSELS.

John D. Ronald, Manufacturer of Steam Fire Engines: None within the last fourteen years—all the time our fire engine works have been located here.

J. & P. Ament, Saw Mill: We have not had a strike since 1879.

CARLETON PLACE.

John Gillies & Co., Founders and Machinists: Have never had a strike or lockout.

Gillies, Son & Co., Woollen Manufacturers: We have never yet experienced any strikes or lockouts in our manufacturing industry.

CHATHAM.

Wm. Gray & Sons, Manufacturers of Fine Carriages: Have had no experience with strikes during the term mentioned, and are also pleased to say that, so far as we can recollect, there have been no strikes in our vicinity during that time.

Labor Correspondent: There has been no strike or lockout in the town of Chatham within the years mentioned.

Tailors' Union: No strike or lockout in Chatham.

Chatham Mfg. Co., Hardwood Lumber Wagons, etc.: None.

Sutherland, Innes & Co., Manufacturers of Staves: None.

CHESLEY.

Krug Bros. & Co., Manufacturers of Furniture: Happy to say that there has been no strike in this village in time mentioned, to our knowledge; neither have we had any trouble with our employees.

CLINTON.

Macpherson & Hovey Co. : There have been no strikes or lockouts here during the past four years.

COBOURG.

The Crossen Car Manufacturing Company (Ltd.): Would say that although these works have been established since 1873, there has never been a strike connected with the same.

Labor Correspondent : There have been no strikes or lockouts in either Cobourg or its vicinity for the past twelve years. There is no trade or labor organization in Cobourg, and as far as I can learn there never has been any. Workpeople are paid as high and are as well satisfied with their condition as anywhere, either in Canada or in the United States.

CORNWALL.

Toronto Paper Manufacturing Co. : None.

Labor Correspondent : No strikes or lockouts. The Order of the Patrons of Industry is growing rapidly in Eastern Ontario, more particularly in the United Counties of Stormont, Dundas and Glengarry.

M. Davis & Sons : Have had no strikes or any interruptions whatever arising from any such cause in our business during the past ten years.

DELHI.

Delhi Canning Co. : Not interested in any strike. Never had any in Delhi.

DESERONTO.

Rathbun Company, Manufacturers of Lumber, etc. : None.

DOON.

M. B. Perine & Co., Manufacturers of Twine, etc. : We never had any strikes in our works.

Doon Woolstock Co. : No strikes or lockouts.

DUNDAS.

J. A. Bowman & Co., Planing Mill, etc. : No strike or lockout.

DUTTON.

F. A. Humpidge : Was never affected by strikes in our stave and heading factory. Employ from five to fifteen hands.

DUNNVILLE.

Albert Bell, Foundry : We have had no strikes or lockouts in this town during the specified time.

FENELON FALLS.

Thos. Robson, Iron Foundry : I have not had anything to do with strikes in any shape or form since I came to the country.

GANANOQUE.

Parmenter & Bullock, Rivet Manufacturers: Cannot say anything about them; never had any.

D. F. Jones Manufacturing Co., Shovels: We have had no strikes or lockouts during the past four years.

Labor Correspondent: No strikes or lockouts within four years in this place.

Gananoque Carriage Co.: None.

GALT.

James Warnock & Co., Edge Tool and Carriage Spring Works: We have worked this business over twenty-five years and during this time have had no trouble with our men, and never had them strike.

GARDEN ISLAND.

The Calvin Co., Lumber, etc.: No strikes here.

GEORGETOWN.

Georgetown Paper Mills: None.

GODERICH.

Buchanan & Son, Planing Mill. We have had neither strikes nor lockouts. We have had no trouble with our men; everything has gone on pleasantly and agreeably ever since the inception of our business.

GUELPH.

Herald Printing Office: None.

Burr Bros., Furniture, etc.: None.

Labor Correspondent: During years mentioned there has been neither strike nor lockout in connection with any trade or manufacture in this city.

The Bell Organ and Piano Co.: Never had a strike or lockout.

A. R. Woodyatt & Co., Manufacturers of Lawn Mowers, etc.: We have never had any difficulties with our employees, either in strikes, lockouts, or any other way, since we commenced business five years ago.

J. G. Morlock: I have had no strikes in my factory.

HAMILTON.

William Hancock, Builder and Contractor: There have been neither strikes nor lockouts in our business during the past four years.

Keewatin Lumbering and Manufacturing Co.: No strike, no lockout.

Alex. Main & Son, Manufacturers of Rope, etc.: We have had no strike or lockout during the time stated.

Simmens, Ward & Evel, Coffins, etc.: We have had no strikes or lockouts.

Ontario Tack Co.: Have had no labor troubles of any description.

E. T. Wright & Co., Wire Traps and Cages: None.

Tuckettt & Son Co., Manufaturers of Tobacco: We have not had any strikes or lockouts.

Leitch & Turnbull, Elevators: We have had no strikes or lockouts in the past four years.

Meakins & Sons, Manufacturers of Brushes, etc.: Never had any strikes or lockouts.

Typographical Union: There has been no lockouts or strikes in the printing trade this year in Hamilton.

Ennis & Co., Piano Manufacturers: Labor too plentiful and not sufficiently organized to cause trouble.

Ontario Rolling Mills Co.: No strikes or lockouts have occurred during the period mentioned.

HANOVER.

Furniture and Undertaking Co.: None.

HAWKESBURY.

Hawkesbury Lumber Co.: None.

HESPELER.

H. W. Karch, Foundry: None.

Lewis Kribbs, Mills: I have employed on an average about twenty men, and have not had trouble in four years, nor in twenty years.

A. B. Jardine & Co., Blacksmiths' Tools, etc.: Neither strike nor lockout in our establishment during the past four years.

Brodie & Co.: No trouble of any kind, except that help is scarce.

The R. Forbes Co., Woollens and Worsteds: No strikes in this section.

INGERSOLL.

Noxon Bros., Agricultural Implements: We have had no strikes or lockouts in our works.

KEEWATIN.

Lumber and Manufacturing Co.: Have had no strikes here at any time.

KINCARDINE.

Watson & Malcolm, Furniture: No strikes or lockouts here.

KINGSTON.

The Kingston *Whig*: No strikes or lockouts in our trade.

Locomotive and Engine Company: Have never had a lockout or a strike.

Canada Hay Company: We never had any trouble with our men:

Davis & Sons, Ship-builders: We are doing business in ship-building and repairs. Have had no trouble with our men in several years.

KINGSVILLE.

S. Wigle & Son, Millers: No strikes or lockouts have affected this place yet.

LAKEPORT.

Lakeport Preserving Company: No strikes or lockouts.

LANCASTER.

W. R.: Never had a strike in the County of Glengarry.

LINDSAY.

Jas. Hamilton, Carriage Works: I have had no strikes in shops.

Sadler, Dundas & Flavelle Milling Co.: No strikes or lockouts. Number of employees, 50.

Gas Works: No strikes or lockouts.

Sylvester Bros., Manufacturing Co.: We have never had any trouble with our men; it probably is on account of us being isolated from other establishments of similar kind, and we avoid as much as possible employing men belonging to the union.

LISLE.

Hatton & Son, Lumber: Have never had any strikes or lockouts.

LISTOWEL.

B. F. Brook & Son, Woollen Manufacturers: Never had any strikes or lockouts.

Labor Correspondent: There have been no strikes or lockouts here for the past four years.

LONDON.

The McCormick Manufacturing Co.: Fortunately nothing of the kind has ever occurred on our works.

John Labatt, Brewer, etc.: No strikes or lockouts have occurred in my establishment.

E. Leonard & Sons, Engines and Boilers: We have not had any strikes or lockouts since entering on business in 1834.

Dominion Baby Carriage Co.: This firm has never had a strike or lockout of any kind.

Welford Bros., Twine, etc.: We employ 12 hands, and have had no strike since we have been in business.

Stevens & Burns, Machinists: We have had no strikes.

Essex Brass and Iron Co.: No strikes or lockouts have ever occurred in connection with these works.

H. McKay, Cigar Manufacturer: We have had no trade troubles of the nature you mention during the time, nor do we know of any in any other establishment of a like nature in the city.

Typographical Union: No strikes or lockouts have occurred in the printing industry in this city for a number of years.

The Wortman & Ward Manufacturing Co.: Have had no strike or lockout in the time mentioned.

MADOC.

James White, Foundry: There is not now nor has there been in the past any labor organization in this place, therefore there have been no strikes. We have first-class schools here. This with a little sound common sense will prevent strikes. In extreme cases a damp sponge placed on the head will have a good effect.

MOUNT FOREST.

Francis Yeo, Carriage Manufacturer: Have run full time and successfully. No complaints.

NAPANEE.

J. Gibbard & Son, Furniture Manufacturers: We have had no trouble with our men in the way of strikes.

NEWBURGH.

James Thompson, Paper Manufacturer: Have been over twenty-five years in business and never had any experience in strikes. In my opinion they are a curse to all concerned.

NEW HAMBURG.

S. Merner & Co., Foundry, etc.: There have been none here of any kind.

NEWMARKET.

R. Park & Co., Tanners: We are happy to say that we were never troubled with a strike of any kind.

The McLaee & Sons Manufacturing Co.: No strikes to report.

W. P. Plant, Foundry: I have had no strikes or lockouts.

NORWOOD.

J. Findlay & Son, Manufacturers of Spokes, etc.: We never had any trouble in this line. No organization. Union men, etc., in our employ.

ORILLIA.

William Ramsay, Carriage Manufacturer: No strikes or lockouts. Everything goes lovely.

OSHAWA.

Iron Moulders' Union: There have been no strikes or lockouts here since 1886.

OTTAWA.

Electric Light Company: Have had no trouble whatever in the way of lockouts or strikes since the organization of the company.

May & Foster, Tanners: We never had a strike or difference with our men.

W. McClymont & Co., Saw and Grist Mills: Have never had any labor strikes.

Ottawa Manufacturing Co., Tents: We are but a small concern. We have had no strikes or lockouts; when hands are too important they are discharged. We do not, n or will we employ union labor. We believe it a mistake and injurious to labor and all industries.

Borbridge & Co., Manufacturers of Trunks, etc.: We have had no strike in our business since 1888.

F. G. Johnstone & Co., Plumbers: I am pleased to say I have no experience in strikes or lockouts. I employ from eight to ten hands. Some of them belong to labor unions. They have so far behaved properly and have always complied with the custom of my shop. I employ good workmen and pay the highest wages going in this market. One firm in our line in this city had a little trouble with its men. This lasted one week and was then satisfactorily settled. Trouble is always the result of employing bad workmen and cheap labor. No good mechanic will join a band of lawless botches unless he is forced into the union by unfair means. I was a journeyman for fifteen years and have not as yet seen any good results of labor organizations—they do not assist other than office-holders.

OWEN SOUND.

W. Kennedy & Sons, Foundry: No strikes or lockouts have taken place in Owen Sound in the last year—1891.

PETERBORO.'

Iron Moulders' Union: No strikes or lockouts in 1888-92.

PLATTSVILLE.

Baird Bros., Furniture: We have never had any trouble with our employees.

PARIS.

The Penman Manufacturing Co.: No strikes or lockouts in the business.

PERTH.

Labor Correspondent: There has never been a strike or lockout in Perth.

PRESTON.

School Furniture Company: No trouble in this section.

ST. CATHARINES.

Cigar-makers' Union: No strike or lockout in the time named.

STRATFORD.

Porteous & McLagan, Manufacturers of Furniture: Neither strike nor lockout in our establishment in its entire history.

L bor Correspondent: No strikes or lockouts in Stratford.

TORONTO.

Gendron Manufacturing Co.: We have never had any strikes or any other troubles with our hands.

Dick, Ridout & Co.: We have had no strikes or lockouts in our business.

Canadian Rubber Co.: Our factory is in Montreal.

Samuel Rogers & Co.: No strike or lockout.

International Brotherhood of Brassworkers' Union No. 23: We have not had any trouble in our trade for the last ten years.

Amalgamated Society of Carpenters and Joiners: There has been no strike or lockout in our trade in this city within the time specified.

Massey-Harris Co.: We have had no strikes or lockouts during past past ten years.

Chas. Rogers and Sons: Have had no strike in this time.

Bennet & Wright, Plumbers, etc.: No strike or lockout since time named.

Elliott & Sons, Painters: No strikes, lockouts, or any other trouble with employees.

American Watch-Case Co.: The American Watch-Case Company have never had any trouble with their employees that could not be settled by the rules of common sense, and have never had a strike of any kind since organization in 1885. We know of no strikes in our line of business in any factories in Canada.

WOODSTOCK.

Labor Correspondent: There has never been any strike or lockout in this town for the past four years worthy of notice.

APPENDIX.

APPENDIX.

LABOR STATISTICS IN VARIOUS COUNTRIES.

The utility and general value of accurate and elaborate statistics of all branches of a nation's wealth and business, and more especially in the subjects of mechanical and manual labor—in the matters of wages, hours of daily employment, number of days of employment in each year, remuneration therefor, cost of living, rent, fuel, clothing, strikes and lockouts, and subjects of kindred import are, at this day, fully recognized by almost every country of the civilized world. This fact is evidenced in legislation in respect of or incidental to questions brought into prominence as a result of statistical enquiry; by the close attention devoted to such subjects by the most able of the social and political teachers and writers of the continents of Europe and America as well as at the antipodes.

Apropos of this subject of statistics, Carl C. Plehn, Ph.D., in an article in the December, 1892, publication of the American Statistical Association, on "The establishment of an Imperial Commission for Labor Statistics in Germany," very pertinently says: "The regular census enumerations give us comparisons of the laboring class with the whole population, of trade with trade, and of skilled with unskilled, in point of numerical strength. This of itself is an important piece of labor statistics. The census also gives us the size of families, condition as to wedlock, dwellings, etc The regularly collected statistics of the movement of population is another very valuable source of such information. A still closer approach to the field of labor statistics is made in the statistics of industries—meaning by industries every place of employment of labor, agricultural or manufacturing, large factory or small shop. . . . . And what is the special field for a Bureau of Labor Statistics? The distinction is not so much one of material as it is one of point of view. It is the social problem viewed from a special standpoint. It is the business of the statistician in this case to ascertain how those persons are situated who live entirely or principally from the wages of their toil. It is, now, a question of classification, of separating the whole population into groups, and putting the laboring class by itself in contrast to the others. For this purpose we have to investigate wages (form and amount), the quality of the labor, the hours of labor, the standard of living, the operation of factory laws, the mobility of the laborer, etc., and there are questions which demand a more direct and individualistic treatment, case by case, than they could have in any general census or industrial statistic. And, secondly, it is the statistician's duty here to investigate the effects on society as a whole, of the conditions thus imposed on the laboring class. We have to consider that class not so much as an important agent in production as an element of the total population, and whose well or ill being will reflect on the whole of society. . . . .

"As a result of considerations similar to the above, and in view of the ever increasing necessity from political considerations of having reliable and complete statistics of labor, a movement has begun in Europe for the establishment of special bureaus. . . . No line of investigation in the whole field of sociology strikes more directly at the very tap-roots of the social problems than this investigation of the conditions of labor."

Great Britain.

Although the "Labor Question" had been investigated by Parliamentary and Crown commissions before that time, it was not until 1886 that the Labor Bureau of the Board of Trade was created in Great Britain. Right Hon. W. E. Gladstone was leader of the Government at that time; Right. Hon. A. J. Mundella was President of the Imperial Board of Trade, and Mr. Henry Broadhurst, M.P., and representative in Parliament of

the Operative Stonemasons' Society of Great Britain, was Parliamentary Secretary to the Board of Trade. During the Parliamentary session of 1886 the late Mr. Charles Bradlaugh, representing Northampton in the House of Commons, in his place in the House strongly and successfully advocated and urged the creation of a Labor Bureau. The Government approved of the suggestion and acted thereon. Mr. John Burnett was appointed the "Labor Correspondent" of this new department of the Board of Trade. The work assigned Mr. Burnett, despite inadequate means and assistance, has been most commendably executed ever since, as has been amply demonstrated by the able, exhaustive and impartial reports laid before Parliament from year to year since his assumption of the duties of that office.

At the annual Trades Union Congress of Great Britain, held at Swansea, Wales, in September, 1887, there were 156 delegates present duly accredited from 132 different labor organizations located throughout Great Britain and Ireland. These organizations included 28 Trades and Labor Councils existing respectively in Aberdeen, Scotland; Belfast, Ireland; Barrow-in-Furness, Bolton, Bradford, Bristol, England; Cardiff, Wales; Edinburgh and Glasgow, Scotland; Hyde, Ipswich, Leeds, Leicester, London, Liverpool, Manchester, Middlesborough, Oldham, Preston, Sheffield, Southpart, England; Swansea, Wales; Bristol, Hull, Nottingham, England, and other large manufacturing districts in the United Kingdom.

On that occasion Mr. Henry Broadhurst, M.P., as secretary, read the annual report of the Parliamentary Committee of the Congress for the term then ending. Among the many important subjects referred to therein was that of "labor statistics."

"It may be remembered," says the report, "that some years ago Mr. Frederick Harrison delivered an able and interesting address on the work of trade unions, dealing specially with the statistics of these organizations. It was at that time suggested that the trade unionists represented at Congress should regularly send to the Secretary of the Parliamentary Committee the reports that they issued from time to time, so that the information therein contained might be used for the instruction of the working classes generally. In the valuable report that has just been issued by the Labor Correspondent of the Board of Trade there are a number of useful statistics, but the committee perceive with regret that only a small number of societies appear to have sent in the information to make that report complete.

"There are many reasons why the statistics of trade unions should be made as widely known as possible, but one of the chief is that the more such particulars were published the better would be seen the advantages that organization confers upon the working classes. More especially is this the case when the figures are treated in the sympathetic spirit shown in the Board of Trade Report.

"After these observations the committee trust that there will be no further hesitation on the part of trade unions generally in giving to the Labor Correspondent whatever information may be in their power."

In 1893—Right Hon. W. E. Gladstone being again leader of the Government, his colleague, Right Hon. A. J. Mundella, being also again President of the Imperial Board of Trade, and Mr. Thomas Burt, M.P., of the Miners' National Union, as Parliamentary Secretary of the Board—the Government, in extension of its policy of 1886 in this matter, created a Department of Labor, which is independent rather than an appendage of the Commercial Department of the Board of Trade, as was the case formerly. Yet it will command all the advantages which can be derived from the existing departments of the Government, in so far as the same may be essential to the success of its mission in the development of its greatly extended sphere of usefulness.

France.

Prof. Chas. D. Hazen, of John Hopkins University, Baltimore, Md., U. S. A., in an article on "French Statistical Publications," in the December, 1892, publication of the American Statistical Association, tells us that "the gathering of statistics in France began to assume some importance toward the close of the Old Regime, but it is only more lately, under the Second Empire and the present Republic that they have been

treated in some measure as a science, and their preparation and publication have come to be an important branch of Government activity."

In the same publication of the Statistical Association, Prof. Carl C. Plehn, of Middlebury College, Vermont, in an article on "The Establishment of an Imperial Commission for Labor Statistics in Germany," incidentally remarks that "it was only last June that France established her *Office du Travail.*"*

Strangely enough, Dr. E. R. L. Gould, special agent of the Labor Department of the United States in Europe, when giving evidence before the Royal Commission on Labor of Great Britain in December, 1892, fell into the same error as Prof. Plehn respecting the date of organization of the *Office du Travail* in Paris, France, as will be perceived in the perusal of the following extract† from his evidence on the occasion referred to. Being questioned in regard to the progress of statistical work along social lines in Europe, Prof. Gould said: "Unquestionably, the movement for the development of labor statistics is taking a very wide extension everywhere. I remember at the Congress which was held in Vienna last year—the Congress of the International Institute of Statistics—the bulk of the more distinguished statisticians enrolled themselves as members of the committee on labor statistics. That was the first indication. The second thing which resulted from the Congress was a resolution from this committee urging upon the attention of different Governments the importance of organizing statistical agencies to deal, in a greater measure than hitherto, with labor and social questions, with the expressed conviction of opinion that that was the most satisfactory way in which we could approach the study of the subject Since that time there have been called into existence commissions in Austria and in Germany to study the question in order to find out in what direction they can best enlarge the study of labor and social statistics. I had a talk the other day in Berlin with Dr. Geheimerath Von Scheel, who is the director of the Imperial Statistical Bureau, Berlin, in which he said they were now discussing the question, and that it was only a matter of a short time when they should have, if not a distinct bureau of labor statistics, at all events a development on one side of his department which should consecrate itself solely to that work. I had a letter a short time ago from Dr. Inama-Sternegg, who is the president of the Imperial Statistical Commission in Vienna, asking me for information in relation to the latest development of American labor statistics, saying that they were determined to extend the Central Statistical Commission in Vienna by adding to it a section which should give itself to the study of labor statistics. Shortly before that I was in Norway, and in conversation with Dr. Kiaer, who is the chief of the Royal Statistical Bureau of Norway, he told me that he was, on his own responsibility, without an increased appropriation, giving himself now to the collection of labor and industrial statistics. The other day in Brussels I had an exceedingly interesting conversation with M. Beernaert, the Prime Minister of Belgium, and M. Leo de Bruyn, the Minister of Agriculture, Commerce and Industry, and both of them told me that they were organizing a distinct labor bureau, on the model, as far as they could make it applicable in their country, of the Department of Labor of the United States. Still a little further back I had the pleasure of assisting at the organization of the French *Office du Travail*, and giving information before the superior council in somewhat similar fashion to what I am now giving you to-day. These things, I think, are plainly indicative of the fact that nations are becoming alive to the point which I have just been endeavoring to make, not to the experimental or possible benefit, but to the certain benefit judging from the past utility of these organs of original social enquiry."

The official report from the Consuls of the United States for June, 1893, contains, among others, a valuable contribution from the pen of Mr. Francis B. Loomis, U. S. Consul at St. Etienne, France, entitled "History of Labor Employment in France." Consul Loomis says that "since 1870 the relations between workmen and employers have

*Prof. Plehn is in error as to the "establishment" of the *Office du Travail* in June, 1892. That office was created in 1887, and opened in Rue J. J. Rousseau, but was transferred to the Rue Chateau d'Eau on the 22nd of May, 1892. See extract from Report of U. S. Consul, Francis B. Loomis, St. Etienne, France, 1893.

†American Statistical Association Publications—March—June, 1893.

been modified by some important measures. The law of March 27, 1884, recognized the utility of workmen's syndicates or trade unions by the following paragraph :

" 'Employers and workmen's syndicates can create and administer, with entire freedom, bureaus for offers and demands for work.'

" Labor exchanges were soon afterwards created in different towns, and the laws relating to workmen's livrets* were repealed.

" Already in 1848 M. Ducoux, prefect of police, conceived the project of creating a labor exchange in one of the populous districts of Paris, and submitted to Parliament a proposition to that effect, and asked for a sum of 300,000 francs to defray the expenses. The proposition was rejected and the question lay dormant until 1875, when M. Delâttre, along with some of his colleagues, laid on the table of the municipal council the following request :

" 'The undersigned request that a labor exchange be created in the Rue de Flandre, in order to afford a shelter to the numerous groups of workingmen who assemble every morning to be employed in the docks.'

" This project, which only affected one district, was made general by the committee appointed to study it, and in a short time the administration was requested to 'establish labor exchanges in every place where workmen of different trades assembled to be hired.'

" However, it was not until 1887 that the project took a definite shape, when a central bureau was opened in the Rue J. J. Rousseau. This bureau was subsequently transfered to the Rue Chateau d'Eau, where it was inaugurated with great solemnity on the 22nd of May, 1892.

" The example of Paris was quickly followed by different provincial towns, and every year new exchanges are being opened.

" These exchanges have for objects : (1) To suppress the assembling of strikers on the public streets ; (2) To facilitate the placing of workmen ; (3) To suppress the registry offices ; (4.) To centralize, offer and demand, and (5) To establish direct relations between workmen in general."

The *Labor Gazette*, official monthly journal of the Labor Department of the Board of Trade of Great Britain, in its issue for July, 1893, contains a summary of a report by Sir J. C. Crowne, H. M. Commercial Attaché at Paris, dated June 30th, in which he says that " for some time past there has been disagreement between the Government and the syndicates connected with the new Labor Exchange, which has been built and endowed with an annual subsidy of £2,000 by the Municipality of Paris. The syndicates exist and hold a legal status under a statute of 1884, which enacts that persons engaged in a common trade may form themselves into associations for the purpose of developing their business interests, and combine with other syndicates to form a union. The most important of the conditions to which these syndicates are subject are contained in clause 4 of the law, which is as follows :

" 'The founders of every professional syndicate must deposit its by-laws, together with the names of those who are in any way charged with its administration or direction, at the office of the Mayor of the locality in which the syndicate is established, or, if in Paris, at the Prefecture of the Seine, and this action must be repeated on the occasion of each change in the directorship or in the by-laws.

" 'The by-laws are to be forwarded to the Procureur de la Republique by the Mayor or the Prefect of the Seine.

" 'The members charged with the administration or direction of any syndicate must be of French nationality and in the enjoyment of civil rights.'

" The law, however, does not assign any fixed time for the performance by the syndicates of the acts above enumerated, and there are, in consequence, numbers of associations established in a permanent way at the *Bourse du Travail* in Paris which have not yet complied with the statute. It appears that a syndicate is illegal if composed of members of different trades. The by-laws to which such a syndicate might agree would probably not meet with approval from the legal authorities. Hence the issue of an order in the first days of June under which the Prefect of the Seine proclaimed that syndicates which did not comply with the provisions of the 4th clause of the Act of 1884 should, on the 5th of July, cease to hold their offices in the *Bourse du Travail*.

*In the thirteenth century it was enacted that all workmen who came to Paris must wear costume of Paris workmen, a nd to furnish some sort of reference or recommendation from their last employers.

"The Bourse has a central hall which holds 3,000 people, and large rooms in which workers on strike can meet, committee rooms where syndicates deliberate, offices where business is transacted, a library with books of reference and many newspapers. The number of associations privileged to use the building is now about 270. The grant of the municipality in aid of the syndicates varies with the number of associations; at first it amounted to 500 fr., now it is 184 per syndicate. The municipality recently passed a resolution increasing the annual grant to 75,000 fr. (£3,000). But the Government has not yet sanctioned this resolution, which is subject to their approval, as indeed is the distribution of funds, which they may suspend if they think fit. The right to control the grants is one of those to which the syndicates object. The Government has threatened to stop the distribution of funds to such syndicates as neglect to comply with the rules laid down by the statute of 1884. Great indignation has been displayed in consequence of this intervention. Meetings have been held and proclamations have been placarded by the syndicates, and a general strike is threatened for the 10th July. One of the chief occupations of the syndicates should be to find employment for the men out of work, but it appears that in 1891 there was only about 70 syndicates attached to the *Bourse du Travail* which attended to this business, and the number of operatives engaged either permanently or temporarily was only about 32,000. The syndicates occupy themselves with promoting other special objects, such as the formation of a federation of labor exchanges, which claims to include 800 syndicates representing 900,000 workers."*

United States.

In 1885 the National Bureau of Statistics was established at Washington, the capital of the United States of America, by the Federal Government, with Hon. Carroll D. Wright as superintendent. In 1888 this Bureau was placed in an independent position —it had up to that date been subordinate to the Department of the Interior—though not raised to the dignity of a cabinet office. Through this change Superintendent Wright became Commissioner and directly responsible to the President of the United States. Besides the great advantage arising from the vastly increased scope and opportunities afforded, the Commissioner is also placed in a position independent of the vicissitudes of party warfare for continuance in office.

Mr. Albert Shaw, in a chapter on "Some Statistical Undertakings at Washington," in the *Review of Reviews*, December, 1891, takes the liberty to say that "the country is only now beginning to appreciate the importance of accurate and elaborate statistical inquiry as a basis for law-making and an aid in intelligent adminstration. As regards most kinds of official statistical work we are several decades behind the European countries, where the scientific collection and use of figures have been carried to a high degree of perfection and efficiency. But in some particular fields of investigation we have been pioneers, and are entitled to much praise for the superior completness and thoroughness of our statistical elucidation. Most notable among these fields has been that of labor and its conditions. The State of Massachusetts deserves credit for having carried statistical work to the most advanced point of scientific value it has reached in this country [U. S. A.], and it was in Massachusetts that the first state bureau of labor statistics was established, in the year 1869. Other states, recognizing the enlightened stand that Massachusetts had taken, created similar bureaus.† There are now twenty-five of these state bureaus of labor statistics engaged in making the most varied and interesting studies of the industrial conditions of the population, and putting forth from year to year a series of volumes that is fast growing into a magnificent library of social and economic data touching the material status of the American people. The purpose of

*Note.—The Government has since taken action in the matter, and the Central Labor Exchange, as well as its branch establishment, in the Rue Jean Jacqus Rousseau, were on the afternoon of the 6th July occupied, and remain closed for the present.

†The other States, and the years in which they created Bureaus of Labor Statistics, are as follows: Pennsylvania, 1872; Connecticut, 1873; Ohio and New Jersey, 1877; Missouri, 1878; Illinois and Indiana, 1879; New York, Michigan, Wisconsin, and California, 1883; Iowa and Maryland, 1884; Kansas, 1885; Nebraska, North Carolina, Maine, and Minnesota, 1887; North and South Dakota, 1890; Tennessee and New Mexico, 1891; Rhode Island, ——; Idaho, ——; and Colorado, ——.

these bureaus has been construed broadly, and their lines of inquiry have reached out to include topics far beyond strict records as to wages in various industries, strikes and lockouts, and the immediate data of industrial life. The state bureaus have emitted not fewer in the aggregate than one hundred and fifty volumes reporting their investigations. By much intercommunication, and by periodical meetings of their directors, the bureaus are enabled to unite, not unfrequently, in making concurrent studies upon identical plans in some desired field. This spirit of co-operation in statistical work is one that it is always well to encourage, not only because it results in a wider and therefore more useful investigation of a given topic, but also because it supplies to the less ably managed bureaus a ready-made plan of action. It is, of course, inevitable that some of the bureaus should be at a loss to decide what particular fields to invade at a given time, and what methods to use. Thus the experience of the Massachusetts bureau, and the others that are well organized, can be drawn upon to give useful direction to the work of younger bureaus. It was the success of the state bureaus and the growth of interest in industrial statistics that lead to the establishment in 1885 of a national bureau at Washington, since entitled the Department of Labor. Col. Carroll D. Wright, who had for a number of years filled the post of director of the Massachusetts bureau, was appointed as the first superintendent of the new department at Washington, and he continues to occupy the position—his incumbency has received the unanimous approval of public men of both great parties, of the workingmen's organizations of the entire country, and of scholarly and scientific economists and statisticians. To Colonel Wright more than to any other man belongs the credit of having developed in this country the existing methods of statistical inquiry into social and industrial conditions. Upon the result of investigations initiated by him there has been based a vast amount of legislation for the protection and benefit of the working classes."

Dr. E. R. L. Gould, while before the Royal Commission on Labor in Great Britain, last December, in reply to a question bearing upon the subject, said that "all the State bureaus originated in response to the directly expressed wishes of the principal labor organizations, each of which has a legislative committee formed for the purpose of urging the passage through the State Legislature of enactments in which it is interested. These committees have always bestowed part of their efforts upon securing liberal appropriations for the labor bureaus."

Dr. Gould also stated that in sixteen States the functions of the labor bureaus are purely statistical; in seven, the control of mine and factory inspection is added; in two, certain duties in regard to immigrants are assigned, and in two the Commissioner of Labor is obliged to intervene on the petition of fifteen of the workmen in the event of a strike taking place at a firm employing twenty-five or more hands.

Canada.

In 1890 the Parliament of Canada concurred in "An Act to Provide for the collection and Publication of Labor Statistics." This law provides that there shall be a branch of the Department of Agriculture known as the Bureau of Labor Statistics, and the Minister of Agriculture for the time being shall be the commissioner of labor statistics.

In this Act provision is also made by which "the Governor-in-Council may, from time to time, appoint an officer who shall be called the 'Assistant Commissioner of Labor Statistics,' shall hold office during pleasure, and shall receive a salary to be determined by the Governor-in-Council." Under this law Mr. George Johnston, of the Census Branch in the Department of Agriculture, became "Chief Clerk and Statistical Officer," a position which he still occupies, with a salary of $2,400 per annum.

Clause 3 of the law creating the Federal "Bureau of Labor Statistics," above referred to, enacts that "The duties of the Commissioner shall be to collect, classify and arrange, and present in quarterly bulletins and in yearly reports to Parliament, statistics relating to all kinds of labor in Canada, and such statistics may be classified in the manner set forth in the schedule to this Act." Except so much information as may have been secured through the census schedules, and incidental thereto, as yet quarterly bulletins and statistics of labor in Canada, as provided for by section 3 of the Act, have not been published.

ONTARIO.

In January, 1882, Hon. S. C. Wood, Commissioner of Agriculture for the Province of Ontario, submitted to the Lieutenant-Governor, Hon. John Beverley Robinson, his annual report for the previous year. In this report Hon. Mr. Wood, referring to agricultural statistics, availed himself of the opportunity to say: "The Agricultural Commission was instructed to inquire into this subject of agricultural statistics and to report upon it, but they were unable to do more than refer to it and commend it to further consideration. My own inquiries and reflection have led me to the conclusion that in the interests of the whole country it is most desirable that we should know our material position and progress from year to year. I am convinced that we should have an organized system for collecting and publishing facts and information relating to the agricultural and other interests of the country, and especially relating to the condition and prospects of the growing crops. A special report, dealing with agricultural statistics in these and other aspects, has been prepared at my request by Mr. Archibald Blue. . . . . What has been done in other countries in the collection of statistics of food supply, what is the practical value of such information and through what agencies it may be most efficiently collected in this province form the subject of Mr. Blue's report. I hope to see the system matured and in operation during the present year. We cannot expect to find it run smoothly from the first, but with the assistance of those whose interests it mostly concerns, I look with confidence for a large measure of success."

During the session of the Provincial Legislature, which opened on the 10th January, 1882, the Government, of which Hon. Mr. Wood was a member, introduced a Bill to give effect to his views in favor of the collection and publication of statistics of the nature and character referred to in his report to the Lieutenant-Governor. This Bill received the favorable consideration of the Legislature, and received the assent of Her Majesty on March 10th of that year, under the title of "An Act to Establish a Bureau of Industries."

At the time of the passage into law of this Act the Provincial Treasurer also performed the duties pertaining and incidental to the office of Commissioner of Agriculture, and to this last-named office was it ordained that the Bureau of Industries was to be attached.

Section 3 of the Act creating the Bureau recites that:

"It shall be the duty of the Commissioner to institute inquiries and collect useful facts relating to the agricultural, mechanical and manufacturing interests of the province, and to adopt measures for disseminating or publishing the same in such manner and form as he finds best adapted to promote improvement within the province and to encourage immigration from other countries; and, amongst other things, to procure and publish early information relating to the supply of grain, breadstuffs and live stock in the other provinces of the Dominion, in Great Britain, and in the United States and other foreign countries in which the province finds a market for its surplus products, and as for the demand therefor, and he shall submit to the Legislature, within thirty days of the opening of each session, a detailed and succinct report of his proceedings."

Section 4 provided that "The Lieutenant-Governor may appoint a secretary of the Bureau, who shall be known as the 'Secretary of the Bureau of Industries,' and may also appoint such other officers as may be necessary for the proper conduct of the Bureau." Mr. Archibald Blue received the appointment as first secretary of the Bureau, and continued as such until 1891, when he was transferred to the newly-created office of Director of Mines, in connection with the Department of Crown Lands.

In 1888, the Legislature enacted a law, intituled "An Act respecting the Department of Agriculture and other Industries," and its first section explains and enacts that "The Commissioner of Agriculture shall hereafter be called the Minister of Agriculture, and he shall, under that name, and subject to section 3 of the 'Act respecting the Executive Council';* have the functions, duties, and powers, which, under and subject to

* "3.—Any of the powers and duties which have been heretofore, or may be hereafter, assigned by law to the officers now constituting, or who may hereafter constitute, the Executive Council, may, from time to time, by Order-in-Council, be assigned and transferred, either for a limited period or otherwise, to any other of the said officers by name or otherwise."—From "An Act respecting the Executive Council." R. S. O., cap. 13, 1887.

the provisions of the said Act, may be from time to time assigned or transferred to him by Order-in-Council."

Section 3 of the same Act provided that "The Act respecting the Executive Council" is further amended so far as the same restricts the Executive Council to six," and as a consequence one more member was added to the number of His Honor the Lieutenant-Governor's constitutional advisers, in the person of the Minister of Agriculture. Mr. Chas. Drury was called to the new portfolio in the same year (1888), with Mr. Archibald Blue as Deputy-Minister and Secretary of the Bureau of Industries.

Hon. Mr. Drury retiring from the position of Minister of Agriculture in 1890, Mr. John Dryden became and still continues to be, his successor; while in 1891, Mr. C. C. James, M.A., Professor of Chemistry at the Ontario Agricultural College, succeeded Mr. A. Blue, as Deputy Minister and Secretary of the Bureau of Industries.

The first direct effort of the Ontario Bureau of Industries to collect and publish statistics of labor was made in 1884. Referring to this subject in his annual report, dated March, 1885, and addressed to the Honorable the Commissioner of Agriculture, Mr. Secretary Blue takes occasion to explain as follows:

"The statistics of labor have been gathered from two sources:—(1) from the men, firms and companies, that pay wages for service, and (2) from the wage-receivers themselves. The returns of employers were collected by Mr. John Leckie, Assistant-Secretary of the Bureau; and those of the working classes by local agents, who made a personal canvass in the towns and cities selected for the collection of statistics. This is the method pursued with success for a number of years by the Massachusetts Bureau." . . .

The Annual Report of the Ontario Bureau of Industries for 1884 was the first containing elaborate statistical tables respecting wages and other important phases of labor life. In the year just referred to the tables were:

XXIII.—Wages of male and female employees as shown by returns of employers of labor in twenty towns and cities of Ontario.

XXIV.—Average wages by occupations in April and October, 1884, based on returns of employers and employees in twenty towns and cities of Ontario; and average per week, for the two weeks (one in April and one in October); of hours employed and wages earned.

XXV.—Average wages, time employed, and cost of living in nineteen towns and cities of Ontario, for the year ending October 31, 1884, based on returns collected from 2,558 work-people, and classified by occupations.

XXVI.—Aggregate and average of wages earned, time employed, and cost of living of 2,853 work-people in nineteen towns and cities of Ontario for the year ending October 31st, 1884.

XXVII.—Statistics of earnings more than, equal to and less than cost of living for the year ending October 31st, 1884.

While the reports of succeeding years contained data of like character to that outlined in the first tables published in 1884, as time progressed information of a more general character was elaborated so as to be of much benefit as a source of general information to every class of the community. Thus the Report for 1886 contained an able and comprehensive paper on "The Industrial Statistics of Ontario," by Mr. Archibald Blue, Secretary of the Ontario Bureau of Industries, which was read at the Third Annual Session of the National Convention of Chiefs and Commissioners of the various Bureaus of Statistics of Labor in the United States, held in Boston in June, 1885, and published in the proceedings of that convention; a chapter on "Laws to Assist and Protect the Working Classes," by T. C. L. Armstrong, M.A., LL.B., Barrister-at-Law, Toronto, and "A Chapter on Labor Organization in Ontario," by Daniel J. O'Donoghue, Toronto; the Report for 1887—"Prison Labor in America," by R. W. Phipps, Toronto; the Report for 1888—a chapter containing a carefully prepared and impartial summary of the evidence submitted to the Royal Labor Commission of 1886*, on the important subjects of

* Upon the recommendation of the Governor-General in Council, a commission was issued on the 9th December, 1886, appointing Hon. James Armstrong, Q.C., and others, members of a Royal Commission, "for the purpose of inquiring into and reporting upon the subject of labor, its relation to capital, the hours of labor, the earnings of laboring men and women, and the means of promoting their material, social

accidents, apprentices, arbitration and conciliation, black-listing, child labor, condition of the working classes, constancy of employment, convict labor, co-operation, cost of living, dwellings of the working classes, employers' liability, factory laws and inspection, female labor, the fining system, hours of labor, immigration and its effects, industrial and technical training, organized labor and its effects, the purchasing power of wages, rents of workingmen's houses, sailors and shipping, sanitary condition and ventilation of workshops and dwellings, and sick and death benefits; while the Annual Report for the year 1889 contained a chapter of sixteen pages on "The Dominion Trades and Labor Congress" from the pen of Mr. D. J. O'Donoghue. The Reports of the Bureau of Industries for 1890 and 1891 contained nothing dealing specially with the question of labor statistics outside those gathered in regard to farm labor.

ONTARIO LEGISLATION.

In the Annual Report of the Ontario Bureau of Industries for the year 1886 there appeared a chapter on "Laws to Assist and Protect the Working Classes," from the pen of Mr. T. C. L. Armstrong, M.A., LL.B., Barrister-at-Law, Toronto. In the introduction thereof the writer, in defining the functions of government as existing in Canada, says:

"The struggle for freedom has removed tyranny and has resulted in popular government, and an almost unrestricted liberty of individual action. But this very freedom of individual action, coupled with absolute protection of property, promotes another species of tyranny in the inequality of condition it invariably produces. This is especially the case where population is dense—the wealthy growing more wealthy and the poor becoming poorer and more dependent. . . . . The problem how best to secure a fair distribution of the national wealth without interfering with private rights or enterprise is yet unsolved. . . . . Modern legislation seeks the solution of the problem by improving the condition of the poor, especially the wage-earning class. With this end in view, it provides means for educating children and adults, of improving the relation between employer and employee, of promoting thrift and industry, and of protecting the savings and earnings of workingmen."

The extent to which the Legislature—the Government—of Ontario has exercised its functions, on the plane indicated by Mr. Armstrong, is well epitomized by those most keenly interested, and in the manner following. The Trades and Labor Congress of the Dominion of Canada held its sixth annual meeting in Ottawa in September, 1890. The official record of its proceedings—page 10—contains the information that the following report was presented by its Legislative Committee for the Province of Ontario, viz.:

The sub-Committee of your Executive, whose special duty it was during the past year to promote as well as watch legislation in the interest of labor in the Provincial Legislature of Ontario, beg leave to report as follows:

We find that since 1872, when organized labor in Ontario—in fact in Canada—first began to figure as a factor in the domain of practical politics, of the many Acts of the Legislature of this Province passed into law since that date, no less than thirty-nine or forty of them have been of more or less direct interest and importance to the wage-earners of the Province. Among these may be mentioned the following as worthy of special enumeration:

1873—"An Act to Facilitate Agreements between Masters and Workmen for Participation in Profits."

intellectual and moral prosperity, and of improving and developing the productive industries of the Dominion, so as to advance and improve the trade and commerce of Canada; also, of inquiring into and reporting on the practical operation of courts of arbitration and conciliation in the settlement of disputes between employers and employees, and on the best mode of settling such disputes; also, of enquiring into and reporting on the expediency of placing all such matters as are to form the subjects of such inquiry under the administration of one of the Ministers of the Crown.

"The Trades' Arbitration Act." This law was intended to facilitate the settlement of disputes between employers and employees.

"An Act to establish Liens in Favor of Mechanics, Machinists, and others."

1874—"An Act to amend the Law relating to the Attachment of Debts, as respects the Wages and Salaries of Mechanics and others." This Act exempts from garnishee wages up to and including $25, except in cases of debt for board or lodging.

"An Act respecting Industrial Schools." This Act makes provision for the reclamation and care of children found begging, receiving alms, wandering about without settled homes or proper guardians, found destitute, neglected by parents or guardians, etc.

1878—"An Act to amend the Mechanics' Lien Act." The preamble to this Act recites that, "Whereas, it is desirable to afford greater protection to the earnings of the working Mechanics, Laborers and Suppliers of materials, than is now provided by law," Her Majesty enacts, etc.

1880—"An Act to Protect the Goods of Lodgers and Boarders against Distress for Rent due Superior Landlord."

"An Act respecting Municipal Assessments and Exemptions." Clause 4 of this Act provides that "the deduction of $400 from the income of a person having an income exceeding that amount shall not be made in case such income exceeds $1,000.

1881—"An Act to make provision for the Safety of Railway Employees and the Public." The preamble recites that, "Whereas, frequent accidents to railway servants and others are occasioned by the neglect of railway companies to provide a fair and reasonable measure of protection against their occurrence," as to frogs, wing-rails, guard rails, freight cars, etc., provisions are made. It is also provided that every highway or other overhead bridge, or other erection or structure over any railway . . . must have "an open and clear headway of not less than seven feet over the top of the highest freight car."

"An Act to amend the law securing to Wives and Children the benefit of Assurance on the lives of their Husbands and Parents."

1882—"An Act to establish a Bureau of Industries." This Department effects much good in collecting and giving very valuable and reliable information as to the supply of labor, rates and wages prevailing, etc., in Ontario.

"An Act to make further provision respecting the Lien of Mechanics and Laborers."

"An Act to provide for the establishment of Free Libraries." This Act provides that on petition to council, signed by not less than 100 electors of a city; not less than 60 in a town, and not less than 30 in an incorporated village, the council may pass a by-law giving effect to the prayer thereof as to the establishment of a free library.

1884—An Act to amend the Mechanics' Lien Act." And still further improving that important measure.

"An Act to secure to Wives and Children the benefit of Life Insurance."

"An Act to extend the Provisions of the Revised Statute respecting Master and Servant." Under the provisions of this Act "proceedings may be taken within one month after the engagement or employment has ceased, or within one month after the Act" became law. The various provisions of this Act as well as its benefits are so well known and admitted now that an enumeration thereof is not necessary here.

1885—"An Act respecting Wages." This Act provides that "in cases of assignment of any real or personal property for the benefit of creditors, the assignee shall pay *in priority* to the claims of the ordinary or general creditors of the person making the same, *the wages or salary* of all persons in the employment, or within one month before the making thereof, not exceeding three months' wages or salary, and such persons shall be entitled to rank as ordinary or general creditors for the residue, if any, of their claims. A like provision is made to apply to the distribution of the assets of a company in liquidation under the "Joint Companies' Winding-Up Act," as well as to the settlement of claims under "The Creditors' Relief Act." The provisions of the "Act respecting Wages," just quoted, *applies to all wage-earners*—whether by the piece, the day, the week, or the month.

"An Act to amend the Laws relating to the Franchise, and the Representation of the People." This Act conferred the right of franchise on wage-earners who earned $250 annually, and part of this may be in the form of board and lodging.

1886—"An Act to amend the Franchise and Representation Act, 1885." Through this amendment "any voter entitled to vote within a city or town shall, on the day of polling, for the purpose of voting, be entitled to absent himself from any service or employment in which he is engaged or employed, from the hour of noon in the day time until the hour of two of the clock next thereafter, and such voter shall not, because of absenting himself, be liable to any penalty, or suffer or incur any reduction from the wages or compensation to which but for such absence he would have been entitled," etc.

"An Act to amend the Revised Statutes respecting Master and Servant," still further improves that law in favor of the servant. It contains a provision that "any agreement or bargain, verbal or written, expressed or implied, which may hereafter be made between any person and any other person not a resident of Canada, for the performance of labor or service, or having reference to the performance of labor or service, by such other person in the Province of Ontario, and made as aforesaid, previous to the migration or coming into Canada of such other person whose labor or service is contracted for, shall be void and of no effect as against the person so migrating or coming."

"An Act to secure Compensation to Workmen in certain cases."

1887—"An Act to amend the Mechanics' Lien Act," by adding to section 6 of the Act the following words: "but such lien during the said periods shall have the same priority for all purposes before as after registration."

"An Act to amend the Workmen's Compensation for Injuries Act" by omitting therefrom the words: "lapse of one year from and after the commencement thereof," and inserting instead the words: first day of April in the year one thousand eight hundred and eighty-eight." By the insertion of the words just quoted the law was made to apply to the Grand Trunk Railway, which was exempt under the Act prior to 1886, so as to enable the employees of that company to make answer to a series of questions propounded by a Committee of the Legislature as to the value to them of the insurance system in connection with that railway. This amendment also extends the provisions of the Act of 1886 so as to apply to other employees than those being members of the G. T. R. insurance association.

"An Act respecting Distress for Rent and Taxes." This Act exempts goods and chattels exempt from seizure or distress by a landlord, except as provided therein.

"An Act relating to Exemptions from Seizure under Execution," by which wearing apparel, certain household effects and necessaries, etc., are exempt from seizure and sale under all circumstances.

"Revised Statutes of Ontario, chap. 193."—Exemptions from Taxation: "The annual income of any person derived from his personal earnings, provided the same does not exceed $700; the annual income of any person to the amount of $400, provided the same does not exceed $1,000. Any person entered on the roll as a wage-earner shall be entitled to the exemption provided for in this sub-section in respect of earnings or income.

1888—"An Act to establish Manhood Suffrage for the Legislative Assembly."

"An Act to Regulate the Closing of Shops and the Hours of Labor therein for Children and Young Persons."

"An Act to amend the Free Libraries Act," by adding to sub-section 2 thereof the following words: "There may also be established evening classes for artisans, mechanics and workingmen in such subjects as may promote a knowledge of the mechanical and manufacturing arts."

1889—"An Act to amend the Ontario Factories' Act." This amendment applies the law where *five* (instead of twenty) or more persons are employed.

"An Act to amend the Ontario Shops Regulations Act," and extending its provisions.

"An Act for the Enforcement of Orders under the Act respecting Master and Servant." Under this Act where a person secures a judgment for wages before a Police Magistrate, the latter has the like power and authority to enforce the payment thereof as are possessed by a Division Court Judge in like cases.

"An Act to amend the Workmen's Compensation for Injuries Act," as experience warranted, and in the direction contemplated by the Act in the first instance.

1890—"An Act respecting Mining Regulations." This measure is applicable to all mines employing six or more persons, and prohibits the employment of any boy under 15 years of age in a mine underground. It also provides that no girl or woman shall be employed at mining work, or for such a purpose in or about a mine. Neither shall any boy of 15 or under 17 years of age work in any mine underground more than 8 hours a day, or more than 48 hours in any one week.

"An Act to simplify the Procedure for Enforcing Mechanics' Liens." This law provides that, instead of taking a case into the ordinary courts, a workingman may file a statement of claim in the office of a Master or Official Referee having jurisdiction, who is empowered as a judge in such cases, and as a consequence of which privilege large law costs are avoided, and where a plaintiff may plead and be heard on his own behalf.

"An Act to amend the Mechanics' Lien Act," making still further beneficial changes and additions to the law respecting mechanics' and laborers' liens.

"An Act to amend the Trades Arbitration Act," so that masters and workmen making the agreement or memorandum mentioned in section 3 of this Act, may by such memorandum or agreement authorize the said Board *to establish a rate of wages* or price of labor or workmanship at which the workmen shall in future be paid.

In so far as the legislation of the Session of 1890 is specially concerned, your Committee desire to bear testimony to the unvarying courtesy accorded them by Attorney-General Mowat, as well as by such of his colleagues in the Government upon whom it was incumbent to wait at any time in reference to needed legislation or for the purpose of offering suggestions as to measures pending during that Session. We are much pleased in being able to report, also, that the Government, in most instances, recognizing the justice of our suggestions, embodied them in Government measures.

While this is true, however, yet very much remains to be done; first, in seeking that legislation affecting the working classes should, as nearly as purely local circumstances will permit, be alike in all the Provinces of the Dominion; and secondly, in agitating in the direction of securing such further legislation as, while not to the detriment of the general interests of the country, will still further improve the conditions surrounding and governing the toilers of the Dominion.

The Session of the Ontario Legislature in 1891 indicates that the Government continued its record of the years gone before in that no less than six measures of more than passing interest to working people were introduced and passed into law. In referring to these Acts, while the titles of them are given in full, the giving of the salient sections of each law will be found sufficient to the proper understanding of the specific object of each measure of itself. These Acts are as follows:

1891—"An Act to amend the Act respecting Master and Servant," provides that after judgment is rendered by one or more Justices of the Peace, wages, not to exceed the sum of $40, must be paid within "eight days" instead of within "twenty-one days," as provided in the original Act. Otherwise the Justice or Justices shall issue his or their warrant of distress for the levying of the wages, together with the costs of conviction and of the distress.

"An Act to amend the Municipal Act, 1891," provides that section 495 of The Municipal Act [granting any county, city or town power to pass by-laws for defined purposes] is amended by inserting the following sub-sections:

13. For establishing schools for the training and education of artisans, mechanics, and workingmen in such subjects as may promote a knowledge of mechanical and manufacturing arts, and for acquiring such real property as may be requisite for such schools; and for erecting and maintaining suitable buildings thereon; and for improving and repairing such school buildings, and for disposing of such property when no longer required.

(*a*) The councils of any municipalities establishing such schools may appoint boards of trustees or managers to conduct the schools, giving them such authority or power for the management of the same as the councils may deem expedient.

Section 504 of the said Act is amended by inserting therein the following as subsection :

(5*a*) For granting money to aid and assist in the construction of public bathing houses within the municipality, to borrow money for such purposes, and to issue debentures to secure the repayment thereof.

"An Act respecting Stationary Engineers," incorporates certain persons named therein, and others who may afterwards register, as "The Ontario Association of Stationary Engineers." Among the provisions of this Act are the following:

. . . . . .

17. The said board may make rules and regulations for their own conduct and for the uniform inspection of steam plant, for the conduct of examinations, for fixing all fees to be charged and for such other purposes as are necessary under this Act, but nothing herein contained shall be deemed to give the Association any power of compulsory inspection.

18. The board, or a committee thereof, shall examine all persons applying under this Act, and shall have power to issue certificates, and such certificates shall, in plain terms, name the particular steam plant the holder is qualified to operate.

19. (1) All persons shall, on application for examination, pay such fee for such examination, including certificate, as may be prescribed.

(2) No certificate or renewal thereof shall be granted to any person addicted to the excessive use of intoxicating liquors, and such certificate may at any time be revoked when the holder thereof has been shown to have been guilty of gross carelessness, incompetence or intemperance.

20. The expression "steam plant," wherever the same occurs in this Act, shall include boilers and steam engines and every part thereof or thing connected therewith, and all other apparatus and things attached to or connected therewith or used with reference to any such engines or under the care of the engineer.

"An Act Revising and Consolidating the Public Schools Acts," provides that

(1) All public schools shall be free schools, and every person between the ages of five and twenty-one years shall have the right to attend some school. Pupils may attend Kindergarten schools from four to seven years.

"An Act respecting Truancy and Compulsory School Attendance." This Act provides that

(2) All children between eight and fourteen years of age shall attend school for the full term during which the school of the section or municipality in which they reside is open each year, unless excused for the reasons hereinafter mentioned, and if the parents or guardians having the legal charge of such children shall fail to send them to school regularly for said full term, or if such children shall absent themselves from school without satisfactory excuse, such parents, guardians and children shall be subject to the provisions and penalties of section 9 of this Act.

(3) Any person who receives into his house a child of any other person under the age of fourteen years, and who is resident with him or in his care or legal custody, shall be deemed thereby to be subject to the same duty with respect to the instruction of such child during such residence as a parent, and shall be liable to be proceeded against as in the case of a parent, if he should fail to cause such child to be instructed as required by this Act; but the duty of the parent under this Act shall not thereby be affected or diminished and shall continue in full force. . . . .

9. If the parent, guardian or other person having the legal charge or control of any child, shall neglect or refuse to cause such child to attend some school after being notified as herein required (unless such child has been excused from such attendance, as provided by this Act), the truant officer shall make, or cause to be made, a complaint

against such parent, guardian or other person, before any police magistrate or justice of the peace having jurisdiction in the municipality in which the offence occurred, and upon conviction of such refusal or neglect such parent, guardian or other person shall be liable to a fine of not less than five dollars, nor more than twenty dollars, or the court may, in its discretion, require persons so convicted to give bonds in the penal sum of one hundred dollars, with one or more sureties, to be approved of by said court, conditioned that the persons so convicted shall cause the child or children under their legal charge or control, to attend some school within five days thereafter, and to remain at school as required by this Act. . . . .

11. The assessors of every municipality shall annually, when making their assessment, enter in a book, to be provided by the clerk of the municipality, in the Form "A" in the schedule to this Act, the name, age and residence of every child between the age of eight and fourteen years, resident in the municipality, and the name and residence of such child's parent or guardian, and return the said book to the clerk of the municipality, with the assessment roll for the use of the truant officer.

"The Woodman's Lien for Wages Act" provides that

3. Any person performing any labor, service or services in connection with any logs or timber in the districts of Algoma, Thunder Bay and Rainy River, shall have a lien thereon for the amount due for such labor, service or services, and the same shall be deemed a first lien or charge on such logs or timber, and shall have precedence of all other claims or liens thereon, except any lien or claim which the Crown may have upon such logs or timber for or in respect of any dues or charges, or which any timber-slide company or owner of slides and booms may have thereon for or in respect of tolls.

27. Any number of lien holders may join in taking proceedings under this Act, or may assign their claims to any one or more persons, but the statement of claim to be filed under section 4 shall include particular statements of the several claims of persons so joining, and shall be verified by the affidavits of such persons so joining, or separate statements of claim may be filed and verified as by this Act provided, and one attachment issued on behalf of all the persons so joining.

31. No payment of wages shall be made or offered to any person for any labor or services performed upon or in connection with any logs or timber in the said districts by any cheque, order, I.O.U., bill of exchange, promissory note, or other undertaking other than bank notes or bills, drawn upon or payable at or within any place or locality not within the Province of Ontario.

32. Any person violating, or who shall direct or knowingly suffer his agent or servant to violate the provisions of section 31 of this Act, shall, upon conviction thereof, be liable to a penalty of not less than $5, and not more than $20, to be recovered by summary proceedings before a stipendiary or police magistrate or justice of the peace, under The Act respecting Summary Convictions before Justices of the Peace and Appeals to General Sessions.

33. No payment made or offered to be made in violation of section 31 of this Act shall be allowed as a defence in any action or proceeding for the recovery of wages, or be given or received in evidence thereon, nor shall any such payment or offer of payment in any way affect any claim of lien for labor or services on logs or timber under this Act, but in case of the payment in whole or in part, or sale or transfer of such paper, writing or instrument by the payee, the sum received by him shall be held and treated as payment or payments on account.

At the 1892 Session the Ontario Legislature passed into law at least seven Bills of specific value in the interest of the labor classes. These will be found enumerated below. In view of the fact that two of them—"The Mines Act," and "An Act to Consolidate the Acts respecting Compensation to Workmen in Certain Cases"—are consolidations of previous laws; they are given at some length, being, as they now are, the existing laws in respect of the subjects to which they refer. The seven Acts referred to are intituled as follows:

THE MINES ACT, 1892.

2. Where the following words occur in this Act, and in Orders-in-Council or Regulations under it, they shall be construed in the manner hereinafter mentioned unless a contrary intention appears. . . . . .

"Shaft" includes pit, and "plan" includes a map and section, and a correct copy or tracing of any original plan as so defined.

"Machinery" steam or other engines, boilers, furnaces, stampers or other crushing apparatus, winding or pumping gear, chains, trucks, tramways, tackle, blocks, ropes or tools, and all appliances of whatsoever kind used in or about in connection with the mine.

"Owner" when used in relation to any mine means any person or body corporate who is the immediate proprietor, or lessee, or occupier of any mine, or of any part thereof, and does not include a person or body corporate who merely receives a royalty, rent or fine from a mine, or is merely the proprietor of a mine subject to any lease, grant or license for the working thereof, or is merely the owner of the soil and not interested in the minerals of the mine.

"Agent" when used in relation to any mine means any person having, on behalf of the owner, care or direction of any mine, or of any part thereof, and includes the words "manager" and "superintendent."

"Inspector" includes any inspector appointed under this Act, and whether for a mining division or any part thereof or for the Province.

21. No person shall have the right of entry as prospector or explorer upon the surface rights of that portion of any lot used as a garden, orchard, vineyard, nursery, plantation or pleasure ground, or upon which crops that may be damaged by such entry are growing, or on which is situated any spring, artificial reservoir, dam or waterworks, or any dwelling-house, out-house, manufactory, public building, church or cemetery, unless with the written consent of the owner, lessee or locatee, or of the person in whom the legal estate therein is vested.

22. There shall be established in connection with the Department of Crown Lands a Bureau of Mines to aid in promoting the mining interests of the Province, and the Lieutenant-Governor in Council may appoint an officer to be known as Director of the Bureau of Mines, who shall act under the direction of the Commissioner of Crown Lands, unless and till otherwise ordered, and who shall be paid such salary as shall be voted by the Legislature.

23. The Director of the Bureau of Mines shall have all the powers, rights and authority throughout the Province which an Inspector or local agent has or may exercise in any mining division or locality, and such other powers, rights and authority for the carrying out of the provisions of this Act as shall be assigned to him by regulations for that purpose.

25. The Lieutenant-Governor may appoint for every mining division or for any part thereof an Inspector, who shall be an officer of the Bureau of Mines, and by Order-in-Council may prescribe the duties and fix the salary of such Inspector.

26.—(1) Every Inspector shall be *ex officio* a Justice of the Peace of the county or united counties, district or districts, which a mining division comprehends or includes, in whole or in part, or in which or in any portion of which a mining division lies; and it shall not be necessary that he shall possess any property qualifications whatever in order to enable him lawfully to act as such Justice of the Peace.

(2) Every Inspector shall have jurisdiction as a Justice of the Peace over all the territory comprised within the division for which he is appointed, and shall have power to settle summarily all disputes between licensees as to the existence or forfeitures of mining claims, and the extent and boundary thereof, and as to the use of water and access thereto, and generally to settle all difficulties, matters or questions between licensees which may arise under this Act; and the decision of such Inspector, in all cases

under this Act, shall be final, except where otherwise provided by this Act, or where another tribunal is appointed under the authority of this Act; and no case under this Act shall be removed into any Court by writ of *certiorari*.

27. No officer appointed under this Act shall, either directly or indirectly, purchase or be or become proprietor of, or interested in, any Crown lands or mining claim; and any such purchase or interest shall be void; and if an officer offends in the premises he shall forfeit his office and the sum of $500 for every such offence, to be recovered in an action by any person who sues for the same.

32. Each mining claim shall be of the following dimensions, namely:

1. For one person, 660 feet along a vein or lode by 330 feet on each side thereof, measuring from the centre of the vein or lode (ten acres more or less).
2. Companies of two or more persons who each hold a miner's license may stake out and work additional feet along a vein or lode by the above width in the proportion of 132 additional feet in length for every additional miner, not to exceed 1,320 feet in length altogether (twenty acres more or less), and may work the claim jointly.

39. The discoverer of a new vein or lode of ore or mineral shall be entitled to two mining claims of the area prescribed by the first sub-section of section 32 of this Act.

40. No person shall be considered a discoverer within the terms of the foregoing section unless the place of the alleged discovery is distant, if on a known vein or lode, at least three miles from the nearest known mine or discovery on the same vein or lode.

45. Any person found removing, or disturbing with intent to remove, any stake, picket or other mark placed under the provisions of this Act, shall forfeit and pay a sum not exceeding $20 and costs; and in default of payment of the fine and costs, may be imprisoned for any period not exceeding one month.

46. Every Inspector appointed in and for a mining division under this Act may appoint any number of constables not exceeding four; and the persons so from time to time appointed shall be, and they are hereby constituted, respectively, constables and peace officers for the purposes of this Act, for and during the terms and within the mining divisions for which they are appointed respectively.

47.—(1) The Lieutenant-Governor in Council may, as often as occasion requires, declare by proclamation that he deems it necessary that the Act respecting Riots near Public Works shall, so far as the provisions therein are applicable, be in force within any mining division or divisions; and upon, from and after the day to be named in any such proclamation, section 1 and sections 3 to 11, inclusive, or the said Act shall, so far as the provisions thereof can be applied therein, take effect within the mining division or mining divisions designated in the proclamation; and the provisions of the said Act shall apply to all persons employed in any mine, or in mining within the limits of such mining division or divisions, as fully and effectually to all intents and purposes as if the persons so employed had been specially mentioned and referred to in the said Act.

(2) The Lieutenant-Governor in Council may in like manner from time to time declare the said Act to be no longer in force in such mining division or divisions; but this shall not prevent the Lieutenant-Governor in Council from again declaring the same to be in force in any such mining division or mining divisions; and no such proclamation shall have effect within the limits of any city.

48. Every person contravening this Part of this Act or any rule or regulation made under it, in any case where no other penalty or punishment is imposed, shall, for every day on which such contravention occurs, or continues or is repeated, incur a fine of not more than $20 and costs; and, in default of payment of the fine and costs, he may be imprisoned for a term of not more than one month.

49. Every Inspector for a mining division may convict upon view of any of the offences punishable under the provisions of this part of this Act or any regulations made under it.

50. The contravention on any day of any of the provisions of this part of this Act, or of any regulation made under it, shall constitute a separate offence and may be punished accordingly.

52. The Inspector of any mining division, or any two Justices of the Peace having jurisdiction in the locality, may try and summarily convict any person guilty of any offence under this part of this Act, or of any breach of the provisions thereof, to which any fine or penalty or forfeiture of money is attached, and shall have all the powers of Justices of the Peace under "The Act respecting Summary Convictions before Justices of the Peace and Appeals to General Sessions"; but this section shall not be construed to give jurisdiction to try or summarily convict for any breach of the provisions of section 27 of this Act.

53. This part shall not apply to any mine unless more than six persons other than the owner are employed under ground, nor to stone quarries; but nevertheless the owners or agents of such mines shall observe and keep the provisions of sections 54 and 55 of this Act, and in case of non-observance thereof shall incur the penalties provided for by section 69 of this Act.

54. No boy under the age of fifteen years shall be employed in or allowed to be for the purposes of employment in any mine to which this Act applies below ground; and no girl or woman shall be employed at mining work or allowed to be for the purposes of employment at mining work in or about any mine.

55. A boy or male young person of the age of fifteen and under the age of seventeen years shall not be employed in or allowed to be for the purpose of employment in any mine to which this part applies below ground for more than forty-eight hours in any one week, or more than eight hours in any one day, or otherwise than in accordance with the regulations following, that is to say:

1. The period of such employment shall be deemed to begin at the time of leaving the surface, and to end at the time of returning to the surface.
2. A week shall mean the period between midnight on Sunday night and midnight on the succeeding Saturday night.

56. The owner or agent of every mine to which this part applies shall keep in the office at the mine, or in the principal office of the mine belonging to the same owner in the district in which the mine is situated, a register, and shall cause to be entered in such register the name, age, residence and date of the first employment of all boys or of all male young persons of the age of fifteen and under the age of seventeen years who are employed in the mine below ground, and shall produce such register to any Inspector at the mines at all reasonable times when required by him, and allow him to inspect and copy the same. The immediate employer of every boy or male young person of the age aforesaid, other than the owner or agent of the mine, before he causes such a boy or male young person to be in any mine to which this part applies below ground, shall report to the owner or agent of such mine, or some person appointed by such owner or agent, that he is about to employ him in such mine.

57. Where there is a shaft, inclined plane, or level in any mine to which this part applies, whether for the purpose of an entrance to such mine or of a communication from one part to another part of such mine, and persons are taken up, down, or along such shaft, plane or level by means of any engine, windlass or gin, driven or worked by steam or any mechanical power, or by an animal, or by manual labor, a person shall not be allowed to have charge of such engine, windlass or gin, or of any part of the machinery, ropes, chains or tackle connected therewith, unless he is a male of at least twenty years of age. Where the engine, windlass or gin is worked by an animal, the person under whose direction the driver of the animal acts shall for the purposes of this section be deemed to be the person in charge of the engine, windlass or gin, but such driver shall not be under sixteen years of age.

58.—(1) If any person contravenes or fails to comply with any provision of this Act with respect to the employment of women, girls, young persons or boys, or to the register of or report respecting boys and male young persons, or to the employment of

persons about any engine, windlass or gin, he shall be guilty of an offence against this Act, and in case of any such contravention, or non-compliance by any person whomsoever in the case of any mine, the owner and agent of such mine shall each be guilty of an offence against this Act, unless he proves that he had taken all reasonable means by publishing and to the best of his power enforcing the provisions of this Act to prevent such contravention or non-compliance.

(2) If it appear that a boy or young person or person employed about an engine, windlass or gin was employed on the representation of his parent or guardian that he was of that age at which his employment would not be in contravention of this Act, and under the belief in good faith that he was of that age, the owner or agent of the mine and the immediate employer shall be exempted from any penalty, and the parent or guardian shall for such misrepresentation be deemed guilty of an offence against this Act.

59.—(1) No wages shall be paid to any person employed in or about any mine to which this Part applies at or within any public house, beer shop or place for the sale of any spirits, wine, beer, or other spirituous or fermented liquor, or other house of entertainment, or any office, garden or place belonging or contiguous thereto or occupied therewith.

(2) Every person who contravenes or fails, or permits any person to contravene or fail to comply with this section shall be guilty of an offence against this Act, and in the event of any such contravention or non-compliance in the case of any mine by any person whomsoever, the owner and agent of such mine shall each be guilty of an offence against this Act, unless he prove that he had taken all reasonable means by publishing and to the best of his power enforcing the provisions of this section to prevent such contravention or non-compliance.

60.—(1) The owner or agent of every mine to which this part applies shall, on or before the first day of December in every year, send to the Bureau of Mines a correct return for the year ending on the preceding 31st day of October of the number of persons ordinarily employed in or about such mine below ground and above ground respectively, and distinguishing the different classes and ages of the persons so employed whose hours of labor are regulated by this Act, the average rate of wages of each class and the total amount of wages paid during the year, the quantity in statute weight of the mineral dressed, and of the undressed material which has been sold, treated or used during that year, and the value or estimated value thereof.

(2) The return shall be in such form as may be from time to time prescribed by the Director of the Bureau, who shall furnish forms for the purpose of such return.

(3) Every owner or agent of a mine who fails to comply with this section, or makes any return which is to his knowledge false in any particular, shall be guilty of an offence against this Act.

61. Where in or about any mine to which this Act applies whether above or below ground, either

1. Loss of life or any personal injury to any person employed in or about the mine occurs by reason of any explosion of gas, powder, or of any steam boiler ; or
2. Loss of life or any serious personal injury to any person employed in or about the mine occurs by reason of any accident whatever, the owner or agent of the mine shall, within twenty-four hours next after the explosion or accident, send notice in writing of the explosion or accident and of the loss of life or personal injury occasioned thereby to the Director of the Bureau of Mines, and shall specify in such notice the character of the explosion or accident and the number of persons killed and injured respectively.

Where any personal injury, of which notice is required to be sent under this section, results in the death of the person injured, notice in writing of the death shall be sent to the Inspector within twenty-four hours after such death comes to the knowledge of the owner or agent. Every owner or agent who fails to act in compliance with this section shall be guilty of an offence against this Act.

62. In any of the following cases, namely :

1. Where any working is commenced for the purpose of opening a new shaft for any mine to which this part applies ;
2. Where a shaft of any mine to which this part applies is abandoned, or the working thereof discontinued ;
3. Where the working of a shaft of any mine to which this part applies is recommenced after an abandonment or discontinuance for a period exceeding two months ; or
4. Where any change occurs in the name of a mine, or in the name of the owner or agent of a mine to which this part applies, or in the officers of any incorporated company which is the owner of a mine to which this part applies ;

The owner or agent of such mine shall give notice thereof to the Inspector within two months after such commencement, abandonment, discontinuance, recommencement or change, and if such notice is not given the owner or agent shall be guilty of an offence against this Act ; provided that this section shall apply only to any working or mine in which more than twelve persons are ordinarily employed below ground.

63.—(1) For the prevention of accidents, where any mine to which this part applies is abandoned or the working thereof discontinued, at whatever time such abandonment os discontinuance occurred, the owner thereof, and every other person interested in the minerals of the mine, shall cause the top of the shaft and any side entrance from the surface to be and to be kept securely fenced ; or shall cause a sign-board to be strongly nailed to a post not less than eight feet high at the top of the shaft, and at any side entrance from the surface, on which there shall be painted in conspicuous letters in durable material the words "Abandoned Mining Shaft." Provided that—

1. Subject to any contract to the contrary, the owner of the mine shall, as between him and any other person interested in the minerals of the mine, be liable to carry into effect this section, and to pay any costs incurred by any other person interested in the minerals of the mine in carrying this section into effect.
2. Where such abandonment or discontinuance has occurred in the case of a mine before the 7th day of April, 1890, this section shall apply only to such shaft or side entrance of the mine as is situate within fifty yards of any highway, road, footpath or place of public resort, or in open or unenclosed land ; or, not being situate as aforesaid, is required by an Inspector in writing to be fenced on the ground that it is specially dangerous.

(2) If any person fail to act in conformity with this section he shall be guilty of an offence against this part, and any shaft or side entrance which is not fenced, or in respect of which the said signboard is not nailed up and kept nailed up as aforesaid as required by this section, and is within fifty yards of any highway, road, footpath or place of public resort, or is in open or unenclosed land, or is required by an Inspector as aforesaid to be fenced, shall be deemed to be a nuisance.

64. No person shall be appointed or authorized to be qualified to act as an Inspector who practices or acts or is a partner of any person who practices or acts as a mining agent, or who is employed by the owners of or is interested in any mine.

65.—(1) An Inspector under this Act shall have power to do all or any of the following things, namely :

1. To make such examination and enquiry as may be necessary to ascertain whether the provisions of this part relating to matters above ground or below ground are complied with in the case of any mine to which this part applies.
2. To enter, inspect and examine any mine to which this part applies, and every portion thereof, at all reasonable times by day and night, but so as not to impede or obstruct the working of the said mine.
3. To examine into and make enquiry respecting the state and condition of any mine to which this part applies, or any portion thereof, and the ventilation of the mine, and all matters and things connected with or relating to the

safety of the persons employed in or about the mine, or any mine contiguous thereto, and to give notice to the owner or agent in writing of any particulars in which he considers such mine or any portion thereof or any matter, thing or practice to be dangerous or defective, and to require the same to be remedied within the period of time named in such notice, and unless the cause of danger be removed or such defect be remedied within the time named, the owner or agent shall be guilty of an offence against this Act.

4. To exercise such other powers as may be necessary for carrying this part into effect.

(2) Every person who wilfully obstructs any Inspector in the execution of his duty under this Act, and every owner and agent of a mine who refuses or neglects to furnish to the Inspector the means necessary for making any entry, inspection, examination or enquiry under this Act in relation to such mine, shall be guilty of an offence against this Act.

66. On the occasion of any examination or inspection of a mine the owner shall, if required so to do, produce to the Inspector or any other person duly authorized by the Commissioner of Crown Lands, an accurate plan of the workings thereof; every such plan as aforesaid shall show the workings of the mine up to within six months of the time of the inspection, and the owner shall, if required by such Inspector or other authorized person, cause to be marked on such plan the progress of the workings of the mine up to the time of such inspection, and shall also permit the Inspector to take a copy or tracing thereof.

67. Every Inspector under this Act shall make an annual report of his proceedings during the preceding year to the Director of Mines, which report shall be laid before the Legislative Assembly. The Commissioner of Crown Lands may at any time direct an Inspector to make a special report with respect to any accident in a mine to which this Act applies, which accident has caused loss of life or personal injury to any person, and in such case shall cause such report to be made public at such time and in such manner as he thinks expedient.

68. In the event of a vacancy in the office of Mining Inspector any notice by this Act required to be given to such officer shall be given to the Director of the Bureau of Mines.

69. Every person employed in or about a mine other than an owner or agent who is guilty of any act or omission which in the case of an owner or agent would be an offence against this part shall be deemed to be guilty of an offence against this Act, and shall be liable to a penalty not exceeding, if he is an owner or agent, fifty dollars, and if he is any other person ten dollars for each offence; and if an Inspector has given written notice of any such offence, to a further penalty not exceeding five dollars for every day after such notice that such offence continues to be committed.

70. Any complaint or information made or laid in pursuance of this Act shall be made or laid within three months from the time when the matter of such complaint or information respectively arose, and

1. The description of any offence under this Act in the words of this Act shall be sufficient in law.
2. Any exception, exemption, proviso, excuse or qualification, whether it does or does not accompany the description of the offence in this Act, may be proved by the defendant, but need not be specified or negatived in the information, and if so specified or negatived no proof in relation to the matter so specified or negatived shall be required on the part of the informant.

71. No prosecution shall be instituted against the owner or agent of a mine to which this part applies for any offence under this Act except by an Inspector, the county or district attorney, or with the consent in writing of the Attorney-General; and in the case of any offence of which the owner or agent of a mine is not guilty, if he proves that he had taken all reasonable means to prevent the commission thereof an Inspector shall not institute any prosecution against such owner or agent if satisfied that he had taken such reasonable means as aforesaid.

72.—(1) Nothing in this Act shall prevent any person from being indicted or liable under any other Act or otherwise to any other or higher penalty or punishment than is provided for any offence by this Act, so that no person be punished twice for the same offence.

(2) If the court before whom a person is charged with an offence under this Act thinks that proceedings ought to be taken against such person for such offence under any other Act or otherwise, the Court may adjourn the case to enable such proceedings to be taken.

73. All prosecutions for the punishment of any offence under this Act may take place before any two or more of Her Majesty's Justices of the Peace having jurisdiction in the county or district in which the offence is committed, or before a Police or Stipendiary Magistrate, and the forms appended to an Act of the Parliament of Canada entitled "An Act respecting Summary proceedings before a Justice of the Peace," or forms to the like effect or similar thereto, shall in all cases be sufficient.

74. The following general rules shall, so far as may be reasonably practicable, be observed in every mine to which this part applies :

1. An adequate amount of ventilation shall be constantly produced in every mine to such an extent that the shafts, winzes, sumps, levels, underground stables and working places of such mine, and the travelling roads to and from such working places, shall be in a fit state for working and passing therein.

2. Gunpowder, dualine, dynamite or other explosive or inflammable substance shall only be used underground in the mine as follows :

a. It shall not be stored in the mine in any quantity exceeding what would be required for use during six working days.

b. It shall not be taken for use into the workings of the mine except in a securely covered case or canister, containing not more than eight pounds.

c A workman shall not have in use at one time in any one place more than one of such cases or canisters.

d. In charging holes for blasting, saving in mines excepted from the operation of this section by the Commissioner of Crown Lands, an iron or steel pricker shall not be used, and a person shall not have in his possession in the mine underground any iron or steel pricker, and an iron or steel tamping rod or stemmer shall not be used for ramming either the wadding or the first part of the tamping or stemming on the powder.

e. A charge of powder which has missed fire shall not be unrammed.

f. A charge which has missed fire may be drawn by a copper pricker, but in no case shall any iron or steel tool be used for the purpose of drawing or drilling out such charge.

3. Every underground plane on which persons travel which is self-acting, or worked by an engine, windlass or gin, shall be provided (if exceeding thirty yards in length) with some proper means of signalling between the stopping places and the ends of the plane, and shall be provided in every case at intervals of not more than twenty yards with sufficient man-holes for places of refuge.

4. Every road on which persons travel underground where the produce of the mine in transit exceeds ten tons in any one hour over any part thereof, and where the load is drawn by a horse or other animal, shall be provided at intervals of not more than one hundred yards with sufficient spaces for places of refuge, each of which spaces shall be of sufficient length, and of at least three feet in width between the wagons running on the tramroad and the side of the road ; and the Commissioner of Crown Lands may, if he see fit, require the Inspector to certify whether the produce of the mine in transit on the road aforesaid does or does not ordinarily exceed the weight as aforesaid.

5. Every man-hole and space for a place of refuge shall be constantly kept clear, and no person shall place anything in a man-hole or such space so as to prevent access thereto.

6. The top of every shaft which was opened before the commencement of the actual working for the time being of the mine and has not been used during such actual working

shall, unless the Inspector otherwise permits, be securely fenced, and the top of every other shaft which for the time being is out of use, or used only as an air shaft, shall be securely fenced, or in either case due notice shall be given by nailing up a signboard as in this Act is hereinbefore provided, as the Inspector shall direct.

7. The top and all entrances between the top and bottom of every working or pumping shaft shall be properly fenced, but this shall not be taken to forbid the temporary removal of the fence for the purpose of repairs or other operations, if proper precautions are used.

8. Where the natural strata are not safe, every working or pumping shaft, adit, tunnel, drive, roadway or other workings shall be securely cased, lined or timbered, or otherwise made secure.

9. Every mine shall be provided with proper and sufficient machinery and appliances for keeping such mine free from water, the accumulation or flowing of which might injuriously affect any other mine.

10. Where one portion of a shaft is used for the ascent and descent of persons by ladders or a man engine, and another portion of the same shaft is used for raising the material gotten in the mine, the first mentioned portion shall be cased or otherwise securely fenced off from the last mentioned portion.

11. Every working shaft in which persons are raised shall, if exceeding fifty yards in depth, and not exempted in writing by the Inspector, be provided with guides and some proper means of communicating distinct and definite signals from the bottom of the shaft and from every entrance for the time being in work between the surface and the bottom of the shaft to the surface, and from the surface to the bottom of the shaft and to every entrance for the time being in work between the surface and the bottom of the shaft.

12. A sufficient cover overhead shall be used when lowering or raising persons in every working shaft, except where it is worked by a windlass, or where the person is employed about the pump or some work of repair in the shaft, or where a written exemption is given by the Inspector.

13. A single linked chain shall not be used for lowering or raising persons in any working shaft or plane except for the short coupling chain attached to the cage or load.

14. There shall be on the drum of every machine used for lowering or raising persons such flanges or horns, and also, if the drum is conical, such other appliances as may be sufficient to prevent the rope from slipping.

15. There shall be attached to every machine worked by steam, water or other mechanical power, and used for lowering or raising persons, an adequate brake, and also a proper indicator (in addition to any mark on the rope) which shows to the person who works the machine the position of the cage or load in the shaft.

16. A proper footway or ladder, inclined at the most convenient angle which the space in which the ladder is fixed allows, shall be provided in every working shaft where no machinery is used for raising or lowering persons; and every such ladder shall have substantial platforms at intervals of not more than forty feet, and no such ladder shall be fixed for permanent use in a vertical or overhanging position unless in shafts used exclusively for pumping. In every mine in which vertical or overhanging ladders shall be in use in the shaft at the time when these rules shall be applied to it, they may be retained provided securely fixed platforms be constructed at intervals of not more than 30 feet from each otner, and such ladders have sufficient spaces for footholds of not less than six inches.

17. If more than twelve persons are ordinarily employed in the mine below ground, sufficient accommodation shall be provided above ground near the principal entrance of the mine, and not in the engine house or boiler house, for enabling the persons employed in the mine to conveniently dry and change their clothes.

18. Every fly-wheel and all exposed and dangerous parts of the machinery used in or about the mine shall be and be kept securely fenced.

19. Every steam boiler shall be provided with a proper steam gauge and water gauge, to show respectively the pressure of steam and the height of water in the boiler, and with a proper safety valve.

20. No person shall wilfully damage, or without proper authority remove or render useless, any fencing, casing, lining, guide, means of signalling, signal, cover, chain, flange, horn, brake, indicator, ladder, platform, steam-gauge, water-gauge, safety-valve or other appliance or thing provided in any mine in compliance with this Act.

21. Every person who contravenes or does not comply with any of the general rules in this section shall be guilty of an offence against this Act, and in the event of any contravention of or non-compliance with any of the said general rules in the case of any mine to which this Act applies by any person whomsoever being proved, the owner and agent of such mine shall each be guilty of an offence against this Act unless he proves that he had taken all reasonable means by publishing and to the best of his power enforcing the said rules as regulations for the working of the mine to prevent such contravention or non-compliance.

75. Every person who pulls down, injures or defaces any rules, notice or abstract posted up by the owner or agent shall be guilty of an offence against this Act.

76. Chapter 31 of the Revised Statutes of Ontario, 1887, chapters 9 and 10 of the Statutes of 53 Victoria and chapter 8 of the Statutes of 54 Victoria are hereby repealed except in so far as may be necessary for the completion of transactions begun thereunder.

An Act to amend the Act respecting Wages.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows :

1. The Act respecting Wages is amended by striking out all the words of section 3 from the beginning to the word "who" in the fourth line, and substituting in lieu thereof the following : "3. All persons in the employment of the execution debtor at the time of the seizure by the sheriff or within one month prior thereto;" and by striking out the words "the said Act," in the sixth line of said section, and substituting therefor the words "The Creditors' Relief Act."

2. All persons in the employment of an absconding debtor at the time of a seizure by the sheriff under the Act respecting Absconding Debtors or within one month prior thereto, shall be entitled to be paid out of any moneys realized out of the property of such debtor, by such sheriff the wages or salary due to them by the absconding debtor, not exceeding three months' wages or salary, in priority to the claims of the other creditors of the absconding debtor and shall be entitled to share *pro rata* with such other creditors as to the residue, if any, of their claims.

An Act to Consolidate the Acts Respecting Compensation to Workmen in Certain Cases.

1. This Act may be known and cited as "The Workmen's Compensation for Injuries Act, 1892."

2. Where the following words occur in this Act, they shall be construed in the manner hereinafter mentioned, unless a contrary intention appears :

(1) "Superintendence" shall be construed as meaning such general superintendence over workmen as is exercised by a foreman, or person in a like position to a foreman, whether the person exercising superintendence is or is not ordinarily engaged in manual labor.

(2) "Employer" shall include a body of persons corporate or unincorporate, and also the legal personal representatives of a deceased employer, and the person liable to pay compensation under section 4 of this Act.

(3) "Workman" does not include a domestic or menial servant, but, save as aforesaid, means any railway servant, and any person who being a laborer, servant in husbandry, journeyman, artificer, handicraftsman, miner, or otherwise engaged in manual labor, whether under the age of twenty-one years, or above that age, has entered into or works under a contract with an employer, whether the contract be made before or after

the passing of this Act, be express or implied, oral or in writing, and be a contract of service or a contract personally to execute any work or labor.

(4) By reason of the act or omission of any person in the service of the employer done or made in obedience to the rules or by-laws of the employer, or in obedience to particular instructions given by the employer or by any person delegated with the authority of the employer in that behalf; or

(5) By reason of the negligence of any person in the service of the employer who has the charge or control of any points, signal, locomotive, engine, machine, or train upon a railway, tramway or street railway;

the workman, or, in case the injury results in death, the legal personal representatives of the workman, and any person entitled in case of death, shall have the same right of compensation and remedies against the employer as if the workman had not been a workman of, nor in the service of the employer, nor engaged in his work.

4.—(1) Where the execution of any work is being carried into effect under any contract, and

(*a*) The person for whom the work, or any part thereof is done, owns or supplies any ways, works, machinery, plant, buildings, or premises used for the purpose of executing the work, and

(*b*) By reason of any defect in the condition or arrangement of such ways, works, machinery, plant, buildings or premises, personal injury is caused to any workman employed by the contractor or by any sub-contractor; and

(*c*) The defect or the failure to discover or remedy the defect arose from the negligence of the person for whom the work or any part thereof is done, or of some person being in his service and entrusted by him with the duty of seeing that such condition or arrangement is proper,

the person for whom the work, or that part of the work is done shall be liable to pay compensation for the injury as if the workman had been employed by him, and for that purpose shall be deemed to be the employer of the workman within the meaning of this Act. Provided, always, that any such contractor or sub-contractor shall be liable to pay compensation for the injury as if this section had not been enacted, so however that double compensation shall not be recoverable for the same injury.

(2) Nothing in this section contained shall affect any rights or liabilities of the person for whom the work is done and the contractor and sub contractor (if any) as between themselves.

5. Where within this Province personal injury is caused to a workman employed on or about any railway:

1. By reason of the lower beams or members of the superstructure of any highway, or other overhead bridge, or any other erection or structure over said railway, not being of a sufficient height from the surface of the rails to admit of an open and clear headway of at least seven feet between the top of the highest freight cars then running on such railway, and the bottom of such lower beams or members; or

2. By reason of the space between the rails in any railway frog, extending from the point of such frog backward to where the heads of such rails are not less than five inches apart, not being filled in with packing; or

3. By reason of the space between any wing-tail and any railway frog, and between any guard-rail and any other rail fixed and used alongside thereof as aforesaid, and between all wing-rails where no other rail intervenes, (save only where the space between the heads of any such wing-rail and railway frog as aforesaid, or between the heads of any such guard-rail and any other rail fixed and used alongside thereof as aforesaid, or between the heads of any such wing-rails where no other rail intervenes as aforesaid, is either less than one and three-quarters of an inch or more than five inches in width), not being at all times during every month of April, May, June, July, August, September and October, filled in with packing;

such injury shall be deemed and taken to have been caused by reason of a defect within

the meaning of sub-section 1 of section 3 of this Act. But nothing in this section contained shall be taken or construed, as in any respect, or for any purpose restricting the meaning of said sub-section.

6. A workman shall not be entitled under this Act to any right of compensation or remedy against the employer in any of the following cases, that is to say :

1. Under sub-section 1 of section 3, unless the defect therein mentioned arose from or had not been discovered or remedied owing to the negligence of the employer or of some person entrusted by him with the duty of seeing that the condition or arrangement of the ways, works, machinery, plant, building or premises are proper.

2. Under sub section 4 of section 3, unless the injury resulted from some impropriety or defect in the rules, by-laws, or instructions therein mentioned ; provided, that where a rule or by-law has been approved or has been accepted as a proper rule or by-law, either by the Lieutenant-Governor in Council, or under and pursuant to any provision in that behalf of any Act of the Legislature of Ontario, or of the Parliament of Canada, it shall not be deemed for the purposes of this Act to be an improper or defective rule or by-law.

3. In any case where the workman knew of the defect or negligence which caused his injury and failed without reasonable excuse to give or cause to be given within a reasonable time, information thereof to the employer or some person superior to himself in the service of the employer, unless he was aware that the employer or such superior already knew of the said defect or negligence. Provided, however, that such workman shall not, by reason only of his continuing in the employment of the employer with knowledge of the defect, negligence, act, or omission, which caused his injury, be deemed to have voluntarily incurred the risk of the injury.

7. The amount of compensation recoverable under this Act shall not exceed either such sum as may be found to be equivalent to the estimated earnings, during the three years preceding the injury of a person in the same grade employed during those years in the like employment within this Province, or the sum of fifteen hundred dollars, whichever is larger ; and such compensation shall not be subject to any deduction or abatement, by reason, or on account, or in respect of any matter or thing whatsoever, save such as is specially provided for in section 12 of this Act.

8. When in any action under this Act compensation is awarded in the case of the death of a workman for an injury sustained by him in the course of his employment, the amount recovered, after deducting the costs not recovered from the defendant may, if the Court or Judge before whom the action is tried so directs, be divided between the wife, husband, parent, and child of the deceased in such shares as the Court or Judge, with or without assessors, as the case may be, or, if the action is tried by a jury, as the jury may determine.

9. An action for the recovery under this Act of compensation for an injury shall not be maintainable against the employer of the workman, unless notice that injury has been sustained is given within twelve weeks, and the action is commenced within six months from the occurrence of the accident causing the injury, or in the case of death within twelve months from the time of death ; provided always that in case of death the want of such notice shall be no bar to the maintenance of such action, if the Judge shall be of opinion that there was reasonable excuse for such want of notice.

10. No contract or agreement made or entered into by a workman shall be a bar or constitute any defence to an action for the recovery under this Act of compensation for any injury,

1. Unless for such workman entering into or making such contract or agreement there was other consideration than that of his being taken into or continued in the employment of the defendant ; nor
2. Unless such other consideration was in the opinion of the Court or Judge before whom such action is tried, ample and adequate ; nor
3. Unless, in the opinion of the Court or Judge, such contract or agreement in view of such other consideration was not on the part of the workman improvident, but was just and reasonable ;

and the burthen of proof in respect of such other consideration, and of the same being ample and adequate, as aforesaid, and that the contract was just and reasonable and was not improvident as aforesaid, shall, in all cases, rest upon the defendant; provided always that notwithstanding anything in this section contained, no contract or agreement whatsoever made or entered into by a workman shall be a bar or constitute any defence to an action for the recovery under this Act of compensation for any injury happening or caused by reason of any of the matters mentioned in section 5 of this Act.

11. Notwithstanding anything contained in this Act, an action under sections 3, 4 or 5 shall lie against the legal personal representatives of a deceased employer.

12. There shall be deducted from any compensation awarded to any workman or representatives of a workman, or persons claiming by, under, or through a workman in respect of any cause of action arising under this Act, any penalty or damages, or part of a penalty or damages which may in pursuance of any other Act, either of the Parliament of Canada, or of the Legislature of Ontario, have been paid to such workman, representatives or persons in respect of the same cause of action; and where an action has been brought under this Act by any workman, or the representatives of any workman, or any persons claiming by, under, or through such workman, for compensation in respect of any cause of action arising under this Act, and payment has not previously been made of any penalty or damages, or part of a penalty or damages under any such Act, either of the said Parliament, or of the said Legislature, in respect of the same cause of action, such workman, representatives or persons shall not, so far as the said Legislature has power so to enact, be entitled thereafter to receive in respect of the same cause of action, any such penalty or damages, or part of a penalty or damages, under any such last mentioned Act.

13.—(1) Notice in respect of an injury under this Act shall give the name and address of the person injured, and shall state in ordinary language the cause of the injury and the date at which it was sustained, and shall be served on the employer, or if there is more than one employer, upon one of such employers.

(2) The notice may be served by delivering the same to or at the residence or place of business of the person on whom it is to be served.

(3) The notice may also be served by post, by a registered letter addressed to the person on whom it is to be served at his last known place of residence or place of business, and if served by post shall be deemed to have been served at the time when a letter containing the same would be delivered in the ordinary course of post, and in proving the service of such notice it shall be sufficient to prove that the notice was properly addressed and registered.

(4) Where the employer is a body of persons corporate or unincorporate the notice shall be served by delivering the same at or by sending it by post in a registered letter addressed to the office, or if there be more than one office, any one of the offices of such body.

(5) The want or insufficiency of the notice required by this section, or by section 9 of this Act, shall not be a bar to the maintenance of an action for the recovery of compensation for the injury if the Court or Judge before whom such action is tried, or, in case of appeal, if the Court hearing the appeal is of opinion that there was reasonable excuse for the want or insufficiency, and that the defendant has not been thereby prejudiced in his defence.

(6) A notice under this section shall be deemed sufficient if in the form or to the effect following:

To *A.B.* of (*here insert employer's address*) *or* To the Company, (*or as the case may be.*)

Take notice, that on the day of 189 , *C.D.*, of (*insert address of injured person*) a workman in your employment sustained personal injury, (*add.* of which he died, *if such be the case*), and that such injury was caused by (*state shortly the cause of injury, e.g.* the fall of a beam).

(Date.)

Yours, etc., X.Y.

14. If the defendant in any action against an employer for compensation for an injury sustained by a workman in the course of his employment intends to rely for a defence on the want of notice or the insufficiency of notice, or on the ground that he was not the employer of the workman injured, he shall, not less than seven days before the hearing of the action, or such other time as may be fixed by the rules regulating the practice of the Court in which the action is brought, give notice to the plaintiff of his intention to rely on that defence, and the Court may, in its discretion, and upon such terms and conditions as may be just in that behalf, order and allow an adjournment of the case for the purpose of enabling such notice to be given; and, subject to any such terms and conditions, any notice given pursuant to and in compliance with the order in that behalf, shall, as to any such action and for all purposes thereof, be held to be a notice given pursuant to and in conformity with sections 9 and 13 of this Act.

15. In an action brought under this Act the particulars of demand or statement of claim shall state in ordinary language the cause of the injury and the date at which it was sustained, and the amount of compensation claimed; and where the action is brought by more than one plaintiff, the amount of compensation claimed by each plaintiff, and where the injury of which the plaintiff complains shall have arisen by reason of the negligence, act, or omission of any person in the service of the defendant, the particulars shall give the name and description of such person.

16.—(1) Upon the trial of an action for recovery of compensation under this Act before a judge without a jury, one or more assessors may be appointed by the court or judge for the purpose of ascertaining the amount of compensation, and the remuneration (if any) to be paid to such assessors shall be fixed and determined by the judge at the trial.

(2) Any person who shall, as hereinafter provided, be appointed to act as an assessor in such action, shall be qualified so to act.

(3) In such action a party who desires assessors to be appointed shall, ten clear days at least before the day for holding the court at which the action is to be tried, file an application stating the number of assessors he proposes to be appointed, and the names, addresses and occupations of the persons who may have expressed their willingness in writing to act as assessors. If the applicant has obtained the consent of the other party to the persons named being appointed, he shall file such consent with his application.

(4) Where the application for the appointment of assessors has been made by one party to an action only, he shall, eight clear days at least before the day for holding the court at which the action is to be tried, serve a copy of the application so filed upon the other party, who may then either file an application for assessors, or file objections to one or more of the persons proposed.

(5) An application for the appointment of assessors may be in the form following, or to the like effect, namely:

In the (*describing the Court*)

"The Workmen's Compensation for Injuries Act, 1892."

BETWEEN Plaintiff.
Defendant.

The plaintiff (*or* defendant) applies to have an assessor (*or* assessors) appointed to assist the Court in ascertaining the amount of compensation to be awarded to the plaintiff, should the judgment be in his favor, and he submits the names of the following persons, who have expressed their willingness in writing to act as assessors should they be appointed.

(*Here set out the names, addresses and occupations of the persons above referred to.*)

(*If the other party consents to the appointment add the following:*

The defendant (*or* plaintiff) consents to the appointment of any of the persons above named to act as assessors in this action, as appears by his consent thereto filed herewith.

Dated this day of

A. B.,

The above named plaintiff, (*or as the case may be*).

(6) Where separate applications are filed by the parties, no objection to the persons proposed shall be made by either party, but the Court or Judge may appoint from the persons named in each application one or more assessor or assessors, provided that the same number of assessors be appointed from the names given in such applications respectively.

(7) In such action brought in a Division Court the applications for the appointment of assessors together with any objections made to the persons proposed, shall be forwarded by the clerk of the Court to the Judge.

(8) Where application for the appointment of assessors is granted, the Court or Judge shall appoint such of the persons proposed for assessors as by the Court or Judge may be deemed fit, subject to the provisions contained in this Act.

(9) In such action where an application for the appointment of assessors has been filed, the Court or Judge may, at any time prior to the trial thereof, nominate one or more additional persons to act as assessors in the action. Where no application for assessors has been made, the Court or Judge may appoint one or more persons to act as assessor or assessors in the action before or on the trial of the action.

(10) If at the time and place appointed for the trial all or any of the assessors appointed shall not attend, the Court or Judge may either proceed to try the action with the assistance of such of the assessors, if any, as shall attend, or may adjourn the trial generally, or upon any terms which the Court or Judge may think fit, or may appoint any person who may be available and who is willing to act, and who is not objected to, or who, if objected to is objected to on some insufficient ground, or the Court or Judge may try the action without assessors.

(11) Every person requiring the Court or Judge to be assisted by assessors shall at the time of filing his application deposit therewith the sum of $4 for every assessor proposed, and such payments shall be considered as costs in the action, unless otherwise ordered by the Court or Judge: Provided, that where a person proposed as an assessor shall have in writing agreed and consented that he will not require his remuneration to be so deposited, no deposit in respect of such person shall be required.

(12) Where an action shall be tried by the Court or Judge with the assistance of assessors in addition to or independently of any assessors proposed by the parties, the remuneration of such assessors shall be borne by the parties, or either of them, as the Judge or Court shall direct.

(13) If after an assessor has been appointed the action shall not be tried, the Court or Judge shall have power to make an allowance to him in respect of any expense or trouble which he may have incurred by reason of his appointment, and direct the payment to be made out of any sum deposited for his remuneration.

(14) The assessors shall sit with and assist the Court or Judge when required with their opinion and special knowledge for the purpose of ascertaining the amount of compensation, if any, which the plaintiff shall be entitled to recover.

17.—(1) Where several actions shall be brought under this Act against a defendant in the same Court in respect of the same negligence, act or omission, the defendant shall be at liberty to apply to the Judge that the said actions shall be consolidated.

(2) Applications for consolidation of actions shall be made upon notice to the plaintiffs affected by such consolidation.

(3) In case several actions shall be brought under this Act against a defendant in the same Court in respect of the same negligence, act or omission, the defendant may, on filing an undertaking to be bound so far as his liability for such negligence, act or omission is concerned by the decision in such one of the said actions as may be selected by the Court or Judge, apply to the Court or Judge for an order to stay the proceedings in the actions other than in the one so selected, until judgment is given in such selected action.

(4) Applications for stay of proceedings shall be made upon notice to the plaintiffs affected by stay of proceedings or *ex parte*.

(5) Upon the hearing of an application for consolidation of actions or for stay of proceedings, the Court or Judge shall have power to impose such terms and conditions and make such order in the matter as may be just.

(6) If an order shall be made by a Court or Judge upon an *ex parte* application to stay proceedings, it shall be competent to the plaintiffs affected by the order to apply to the Court or Judge (as the case may be) upon notice or *ex parte*, to vary or discharge the order so made, and upon such last mentioned application such order shall be made as the Court or Judge shall think fit and the Court or Judge shall have power to dispose of the costs occasioned by such order as may be deemed right.

(7) In case a verdict in the selected action shall be given against the defendant, the plaintiffs in the actions stayed shall be at liberty to proceed for the purpose of ascertaining and recovering their damages and costs.

(8) A defendant may, by notice to the opposite party to be given or served at least six days before the day appointed for the trial of the action, admit the truth of any statement of his liability for any alleged negligence, act or omission as set forth or contained in the plaintiff's statement or particulars of claim in the action, and after such notice given the plaintiff shall not be allowed any expense thereafter incurred for the purpose of proving the matters so admitted.

(9) Where two or more persons are joined as plaintiffs under sub-section 1 of this section, and the negligence, act or omission which is the cause of action shall be proved, the judgment shall be for all the plaintiffs, but the amount of compensation, if any, that each plaintiff is entitled to shall be separately found and set forth in the judgment, and the amount of costs awarded in the action shall be ordered to be paid to such person and in such manner as the Court or Judge may think fit; should the defendant fail to pay the several amounts of compensation and the costs awarded in the action, execution may issue as in an ordinary action, and should the proceeds of the execution be insufficient, after deducting all costs, to pay the whole of the amounts awarded, a dividend shall be paid to each plaintiff, calculated upon the proportion of the amount which shall have been awarded to the respective plaintiffs to the total amount realized after the deduction of all the costs of the action as aforesaid.

18. Where the time for doing any act, taking any proceeding, or giving any notice under or required by this Act expires on a Sunday such act, or proceeding, or notice shall, so far as regards the time of doing, taking or giving the same, be held to be duly and sufficiently done, taken or given, if done, taken or given, on the day next following such Sunday.

19. In an action brought in any Court to recover compensation under this Act, the forms and methods, and the rules and orders in force in Court shall, subject to and save as otherwise provided by the terms and provisions of this Act, apply to and regulate all matters of pleading, practice and procedure in such action, and notwithstanding anything in this Act contained, the forms and method, and the pleadings, practice and procedure in any such action shall conform to and be regulated by any rules or orders in that behalf hereafter lawfully and duly made or prescribed with respect to actions brought in any such Court.

20. All Acts and parts of Acts inconsistent with this Act are hereby repealed; but such repeal shall not affect, nor shall any provision of this Act prejudice, anything heretofore done or suffered, or any right hertofore acquired or accrued under or in pursuance of said Acts or parts of Acts so repealed; and any proceeding in respect of any such right, and any action, suit or proceeding under or in pursuance of said last mentioned Acts or parts of Acts shall be instituted, continued, and completed, and determined, and dealt with in all respects and for all purposes as if this Act had not been passed.

An Act to amend the Act respecting the law of Landlord and Tenant.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. Section 27 of the Act respecting the law of Landlord and Tenant, is amended by adding at the end of sub-section 1 thereof the following words: "Provided that in the case of a monthly tenancy such exemption shall only apply to two months' arrears of rent."

[Sub-section one of section 27 of the Act just mentioned is as follows: "(1) The goods and chattels exempt from seizure under execution shall not be liable to seizure by distress by a landlord for rent in respect of a tenancy created after the first day of October, 1887, except as hereinafter provided; nor shall such goods be liable to seizure by distress by a collector of taxes accruing after the said day of October, 1887, unless they are the property of the person actually assessed for the premises, and whose name also appears upon the collector's rolls for the year as liable therefor."]

AN ACT TO AMEND THE FREE LIBRARIES ACT.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. Section 4 of the Free Libraries Act is amended by adding thereto the following words:

"But no free library board shall in any year purchase any lands or erect any buildings or make any additions or alterations thereto exceeding in cost $2,000 without the authority of the municipal council."

2. Section 6 of the said Act is repealed and the following substituted therefor:

6. The board of management shall submit to the council not later than the first day of March in each year a detailed estimate of the several sums required to pay during the ensuing financial year:

1. Interest on any money borrowed as hereinafter mentioned;
2. The amount of the sinking fund;
3. The expense in detail of maintaining and managing the libraries or news rooms under their control and of making any purchases required therefor.

3.—(1) Section 8 of the said Act is amended by substituting the words "one-quarter" for "one-half" in the 7th line of the said section, but this amendment shall only apply to cities having a population of 100,000 or over.

(2) Sub-section 5 of section 8 of the said Act is amended by striking out the words "the said limit of" in the fifth line of said sub-section.

4. In case any free library board requires the council to raise, as provided in the said Act, any money involving an assessment, exceeding the amount specified in section 3 hereof for the purpose of purchasing or erecting buildings, the council by a two-thirds vote of all the members thereof, may refuse to raise such sum, and if the board so requires the question shall be submitted by the council to a vote of the electors of the municipality entitled to vote on money by-laws, in the manner provided by the Municipal Act in respect of by-laws for the creation of debts, and in the event of the assent of the electors being obtained it shall be the duty of the council to raise the said amount in the manner provided by the said Act.

5. No free library board shall establish or maintain a museum except by and with the consent of the council of the municipality, but this section shall only apply to cities having a population of 100,000 or over.

THE ASSESSMENT AMENDMENT ACT, 1892.

1. Sub-section 23 of section 7 of the Assessment Act is amended by striking out the words "provided the same does not exceed $700," in the second line thereof, and substituting therefor the words "to the amount of $700."

2. Sub section 24 of said section 7 is amended by striking out all after the first line thereof, and by adding the words "derived from any source other than personal earnings."

3. The following shall be added as sub-section 24*a* of said section 7:

24*a*. Provided, nevertheless that no person shall be exempted for or in respect of income for a sum greater than $700, whether derived from personal earnings or from other sources of income, or from the two combined.

The amendments to the Assessment Act, as just quoted, are in respect of income exemptions from taxation, so that the law in that particular now is:

"7.—(23) The annual income of any person derived from his personal earnings to the amount of $700."

"(24) The annual income of any person to the amount of $400 derived from any source other than personal earnings."

"(24*a*) Provided, nevertheless that no person shall be exempted for or in respect of income for a sum greater than $700, whether derived from personal earnings or from other sources of income, or from the two combined."

AN ACT FOR THE PROTECTION OF PERSONS EMPLOYED IN PLACES OF BUSINESS OTHER THAN FACTORIES.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1.—(1) This Act does not apply to any place of business which is within the operation of the Ontario Factories' Act or the Ontario Factories' Amendment Act, 1889; nor (2) to any place of business where the only persons employed are members of the same family, nor (3) to any place of business where the persons employed are not more than five in number; nor (4) to any place of business where women or girls are not employed.

2. Save as mentioned in the preceding section, this Act applies to every place of business whether for the sale or manufacture of goods, or for any other kind of business, in which women or girls are employed, and to all rooms and buildings used in connection with or for the purposes of the business.

3. Every building or apartment or place to which this Act applies shall be kept properly ventilated so as not to be injurious to the persons employed therein, and shall have in connection therewith, or within convenient distance and with convenient access thereto, a sufficient number and description of privies, earth or water-closets and urinals for the employees of the business; such closets and urinals shall at all times be kept clean and well ventilated; and separate sets thereof shall be provided for the use of male and female employees, and shall have respectively separate approaches.

4. Every person who in his own behalf, as owner or partner or as the manager or agent for the person, firm, company or corporation occupying the premises, has charge of the business and employs persons therein, shall be responsible for every violation of this Act in the same manner as employers under the Factories' Act. (s. 2, s.s. 3.)

5. Every municipal council to which this Act applies shall appoint inspectors, or authorize persons to act as inspectors, for the enforcement of this Act, and shall make regulations or by-laws respecting their conduct and duties, and for the enforcement of this Act generally.

6. All fines imposed under this Act shall be paid over to the treasurer of the municipality to and for the use of the municipality notwithstanding anything contained in section 37 of the Factories' Act.

7. Except as aforesaid sections 32 to 39 inclusive of the Factories' Act shall apply to this Act.

[Sections 32 to 39 inclusive, of the Factories' Act referred to in next preceding section 7, refer to power of Court in addition to inflicting fine; power of employer to exempt himself from fine on conviction of the actual offender; inspector to proceed against actual offender; fines on persons committing offence for which employer is liable; restraint on cumulative fines; application of fines and penalties; limitation of time and general provisions as to summary proceedings; and prosecutions and procedure.]

AN ACT TO CONSOLIDATE THE ACTS RESPECTING MUNICIPAL INSTITUTIONS AS AMENDED IN CERTAIN PARTICULARS BY THE MUNICIPAL AMENDMENT ACT, 1892.

73.—(1) No person shall be qualified to be elected a mayor, alderman, reeve, deputy-reeve, or councillor of any municipality unless such person resides within the municipality, or within two miles thereof, and is a natural born or naturalized subject of

Her Majesty, and a male of the full age of twenty-one years, and is not disqualified under this Act, and has, or whose wife has, at the time of the election, as proprietor or tenant, a legal or equitable freehold or leasehold, or partly freehold and partly leasehold, or partly legal and partly equitable, rated in his own name, or in the name of his wife, on the last revised assessment roll of the municipality, to at least the value following, over and above all charges, liens, and encumbrances affecting the same elsewhere than in the districts of Muskoka, Parry Sound, Nipissing, Algoma, Thunder Bay, Rainy River, and the provisional county of Haliburton:

1. In incorporated villages—freehold to $200, or leasehold to $400;
2. In towns—freehold to $600, or leasehold to $1,200;
3. In cities—freehold to $1,000, or leasehold to $2,000;
4. In townships—freehold to $400, or leasehold to $800; and in the said last named districts and provisional county:
5. In townships and incorporated villages—freehold to $200, or leasehold to $400;
6. In towns—freehold to $400, or leasehold to $800.

And so in the same proportions in all municipalities in case the property is partly freehold and partly leasehold.

But, if within any municipality any such person is at the time of election in actual occupation of any such freehold, rated in his own name or in the name of his wife, on the last revised assessment roll of the said municipality, he will be entitled to be elected, if the value at which such freehold is actually rated in said assessment roll amounts to not less than $2,000, and for that purpose the said value shall not be affected or reduced by any lien, encumbrance or charge existing on or affecting such freehold.

(2) No person who has, or whose wife has, property duly rated on the last revised assessment roll, sufficient to qualify him as in the preceding sub-section required, shall be deemed to be disqualified by the alienation by sale or otherwise of the said property, or by the expiration or surrender of the demised term, between the date of the return of the assessment roll and the time of his election, provided that at the time of his election such person is resident within the municipality and has, or his wife has, as proprietor or tenant, a legal or equitable freehold or leasehold, or partly freehold and partly leasehold, or partly legal and partly equitable estate of sufficient assessed value to qualify him for election under the preceding sub-section.

74. The term "leasehold" in the last preceding section shall not include a term less than a tenancy for a year, or from year to year; and the qualifications of all persons where a qualification is required under this Act, may be of an estate either legal or equitable, or may be composed partly of each.

479. The council of every county, township, city, town and incorporated village may pass by-laws:

. . . . . .

489.—(16*a*.) For inspecting and regulating the construction and erection of hoists, scaffoldings, and other constructions used in the erecting, repairing, altering, or improving buildings, chimneys, or other structures; and for making all necessary regulations for the protection and safety of workmen and other persons employed thereon, and for appointing inspectors of scaffolding.

493.—(1) For licensing and regulating plumbers.

495.—(13) For establishing schools for the training and education of artisans, mechanics, and workingmen in such subjects as may promote a knowledge of mechanical and manufacturing arts, and for acquiring such real property as may be requisite for such schools, and for erecting and maintaining suitable buildings thereon, and for improving and repairing such school buildings and for disposing of such property when no longer required.

(14) For making grants in aid of such schools as may be deemed expedient.

496.—(9*a*.) For regulating the construction of cranes, hoists and elevators, and determining the manner in which elevators in buildings shall be constructed and worked whether automatically or otherwise), and for providing for the inspection of all cranes,

hoists and elevators, but none of the provisions of the by-laws shall be inconsistent with the Factory Act so far as the same provides for the regulation or construction of cranes, hoists and elevators.

1892.—"An Act respecting Insurance Corporations." The following sections of this Act are of interest to labor organizations, namely :

2. Sub-section 4. "Society," or "Friendly Society," includes any corporation, society, association, or fraternity, benevolent, mutual, provident, industrial, or co-operative, or the like, which not being a corporation within the intent of sections 5 or 6 of this Act (i. e., Insurance Licenses of the Provinces and of the Dominion) required by law to be licensed for the transaction of insurance, undertakes or effects for valuable consideration, or agrees, or offers so to undertake, or effect, with any person in the Province, any contract of insurance, etc.

. . . . . .

Proviso C, provided also that, in the case of a friendly society incorporated elsewhere than in Ontario, the central governing or controlling body within the Province, if incorporated by virtue of a statute of Ontario, may, in the discretion of the registrar, be dealt with as the society for any or all purposes of this Act.

3. After the 31st day of December, 1892, no insurance . . . . shall be transacted or undertaken in Ontario, except by a corporation duly registered as herein provided.

9. Sub-section 3. Any lawfully incorporated Trades Union in Ontario, which, under the authority of the incorporating Act, has an insurance or benefit fund for the benefit of of its own members exclusively, shall, upon due application for registry hereunder, be entitled to be registered on the Friendly Society Register.

Provided that, where any organization of workmen not entering into a formal contract of insurance with its members, provides by its constitution, by-laws or rules for the assistance, relief or support of its members, the registrar may, by writing under his hand and the seal of his office, declare the organization exempt from the operation of this Act, and such certificate shall remain valid until by like writing revoked ; and the organization so exempted shall not be subject to any penalty imposed by this Act.

17. Sub-section 3. Where, at the passing of this Act, a friendly society having its head office elsewhere than in Ontario has in the charge, possession, custody, or power of officers or agents resident in Ontario a reserve fund or funds for the security or assistance of members of the society, such fund or funds shall be deemed to be a fund held in trust for members in the jurisdiction of the said officers or agents, and the said officers or agents shall be deemed and shall continue to be trustees of the said fund or funds until other trustees thereof, resident in Ontario, are appointed by competent authority, and such trust fund or funds or as much thereof as from time to time remains unexpended shall be invested as enacted in section 29 of this Act.

22. Sub-section 2. The registration of a friendly society under this Act, or under any amending Act, shall not be deemed to authorize the society to undertake contracts of insurance elsewhere than in the Province of Ontario.

Sub-section 3. No friendly society shall, under penalty of becoming disentitled to registry, circulate, publish or print any statement contrary to the intent of this section, and any officer, employee or agent of the society, who makes use of such contrary statement for the purpose of obtaining or transacting insurance, shall be guilty of an offence, and shall upon summary conviction thereof before any police magistrate or justice of the peace having jurisdiction where the offence was committed, be liable as for an offence against section 27 of this Act, and all the provisions of the said 27th section shall equally apply in the case of an offence committed against this section.

27. Sub-section 1. After the 31st day of December, 1892, no person or persons, or body corporate or unincorporated, other than a corporation standing registered under this Act and persons duly authorized by such registered corporation to act in its behalf, shall undertake or effect, or offer to undertake or effect, any contract of insurance.

Sub-section 2. If any promoter, organizer, office-bearer, manager, director, officer, collector, agent, employee, or person whatsoever, other than as enacted in the next preceding sub-section, undertakes or effects, or agrees or offers to undertake or effect any contract of insurance, he shall be guilty of an offence, and upon summary conviction thereof before any police magistrate or justice of the peace, having jurisdiction where the offence was committed, shall be liable to a penalty not exceeding $200 and costs, and not less than $20 and costs, and in default of payment, the offender shall be imprisoned with or without hard labor for a term not exceeding three months and not less than one month, and on a second or any subsequent conviction he shall be imprisoned with hard labor for a term not exceeding twelve months and not less than three months.

Sub-section 3. Anyone may be prosecutor or complainant under this Act, and one-half of any fine imposed by virtue of this Act shall, when received, belong to Her Majesty for the use of the Province, and the other half shall belong to the prosecutor or complainant.

63. Sub-section 3. For the purposes of this Act, affidavits and depositions may be taken and made before any justice of the peace, notary public or commissioner in the High Court for taking affidavits.

DOMINION LEGISLATION

Affecting in a more or less specific degree the interests and welfare of the Wage-earning classes in Canada.

1869.—"An Act respecting Immigration and Immigrants." Section 8 of this Act recites that "if any contract is made or any bond or note given by an immigrant before leaving Europe for Canada, to repay, in Canada, any sum of money advanced to him for or towards defraying any other expense attending his emigration, such sum shall be recoverable from the immigrant in Canada, according to the terms of such instrument, by suit in any court of competent jurisdiction in Canada, and every immigrant who, in consideration of money advanced as aforesaid engages and binds himself to enter the service of any employer in Canada on his arrival there, in any capacity, and to work for and serve such employer in such capacity during any certain time, not exceeding six months, and at any named rate of wages, and afterwards refuses or neglects on his arrival in Canada to perform such engagement, shall be liable, on summary conviction, to a penalty not exceeding twenty dollars and costs and to imprisonment until such penalty and costs are paid."*

1872.—"An Act respecting Trade Unions."

2. In this Act, unless the context otherwise requires, the expression "Trade Union" means such combination, whether tempory or permanent, for regulating the relations between workmen and masters, or for imposing restrictive conditions on the conduct of any trade or business, as would, but for this Act, have been deemed to be an unlawful combination by reason of some one or more of its purposes being in restraint of trade.

3. This Act shall not affect:

(1) Any agreement between partners as to their own business;

(2) Any agreement between an employer and those employed by him as to such employment;

(3) Any agreement in consideration of the sale of the good-will of a business of instruction in any profession, trade or handicraft.

* In this connection the Revised Statutes of Ontario (1887), chapter 27, section 8, say:

(1) "Any agreement or bargain, verbal or written, express or implied, which may hereafter be made between any person and any other person not a resident of Canada, for the performance of labor or service, or having reference to the performance of labor or service by such other person in the Province of Ontario, and made as aforesaid, previous to the migration or coming into Canada of such other person whose labor or service is contracted for, *shall be void and of no effect as against the person only so migrating or coming.*"

4. Nothing in this Act shall enable any court to entertain any legal proceeding instituted with the object of directly enforcing or recovering damages for the breach of any of the following agreements, that is to say:

(1) Any agreement between members of a trade union as such, concerning the conditions on which any members for the time being of the trade union, shall or shall not sell their goods, transact business, employ or be employed;

(2) Any agreement for the payment by any person of any subscription or penalty to a trade union;

(3) Any agreement for the application of the funds of a trade union—

(*a*) To provide benefits to members; or

(*b*) To furnish contributions to any employer or workman, not a member of such trade union, in consideration of such employer or workman acting in conformity with the rules or resolutions of such trade union; or

(*c*) To discharge any fine imposed upon any person by sentence of a court of justice;

(4) Any agreement made between one trade union and another;

(5) Any bond to secure the performance of any of the above-mentioned agreements.

But nothing in this section shall be deemed to constitute any of the agreements above-mentioned unlawful.

5. No Act in force in Canada providing for the constitution and incorporation of charitable, benevolent or provident institutions, shall include or apply to trade unions, *and this Act shall not apply to any trade union not registered under this Act.*

[The words last above are italicised with the design of attracting particular attention].

13. The Registrar-General of Canada shall be the registrar under this Act.

22. The purposes of any trade union shall not, by reason merely that they are in restraint of trade, be deemed to be unlawful, so as to render any member of such trade union liable to criminal prosecution for conspiracy or otherwise, so as to render void or voidable any agreement or trust.

23. The Registrar-General of Canada shall lay before Parliament annual reports with respect to the matters transacted by him as registrar under this Act, and in pursuance thereof.

Matters to be provided for by the Rules of Trade Unions registered under this Act:

(1) The name of the trade union and place of meeting for the business of the trade union;

(2) Every object for which the trade union is to be established, the purposes for which the funds thereof shall be applicable and the conditions under which any member may become entitled to any benefit assured thereby, and the fines and forfeitures which may be imposed on any member of such trade union.

(3) The manner of making, altering, amending and rescinding rules.

(4) A provision for the appointment and removal of a general committee of management, and of a trustee or trustees, treasurer and other officers.

(5) A provision for the investment of the funds, and for an annual or periodical audit of accounts.

(6) The inspection of the books and names of members of the trade union by every person having an interest in the funds of the trade union.

1872—"An Act to amend the Criminal Law relating to Violence, Threats and Molestations," specifically names certain acts, whether by masters or by workmen, which shall be offences under its provisions, and the person or persons convicted thereof "shall be liable to imprisonment, with or without hard labor, for a term not exceeding three months." Prior to the enactment of this Statute a conviction for any of the offences mentioned therein would have involved a statutory sentence of "imprisonment for any term less than two years" without the option of a fine.

1875.—"An Act to amend The Immigration Act of 1872."

1. In this Act the word "ship" includes every description of vessel used in navigation not propelled by oars.

2. There shall be raised, levied and collected a duty payable in the manner hereinafter prescribed by the master of every ship arriving in any port in Canada from any port in Europe with passengers or emigrants therefrom at any time when this Act is in force as hereinafter provided, in addition to any duty payable by the master of such ship, under the first section of "The Immigration Act of 1872," and such duty shall be such sum not exceeding two dollars for every passenger or immigrant above the age of one year to be landed in Canada, as may have been specified in the Proclamation giving effect to this Act, in force for the time being in the Province in which such port is situate.

3. The said duty shall be paid by the master of the ship or by some person on his behalf, to the Collector of Customs at the port in Canada at which such vessel is first entered, and at the time of making such first entry which shall contain on the face of it the number of passengers actually embarked on board the ship, and the number to be landed in Canada, and no such entry made at any such time, shall be deemed validly made, or have any legal effect whatever, unless such numbers are correctly stated and such duty has been fully paid.

4. This Act shall take effect upon, from and after the day, and in the Province or Provinces, and for the amount of duty (within the limit aforesaid) specified by Proclamation in that behalf issued under an Order of the Governor-General in Council, and not before, etc.; and every such proclamation shall be published in the *Canada Gazette*.

1876.—"An Act to amend the Criminal Law relating to Violence, Threats and Molestation."

1. The Act of the thirty-eighth year of Her Majesty's reign, chapter thirty-nine, intituled "An Act to amend the provisions of An Act to amend the Criminal law relating to Violence, Threats and Molestation," is hereby repealed.

2. The second section of the Act of the thirty-fifth year of Her Majesty's reign, chapter thirty-one, intituled "An Act to amend the Criminal Law relating to Violence, Threats and Molestation," shall remain repealed, and the following provisions shall be substituted instead thereof, and shall hereafter be read as forming the first section of the said Act, which shall be construed accordingly :

1. Every person who wrongfully and without lawful authority, with a view to compel any other person to abstain from doing anything which he has a legal right to do, or to do anything from which he has a legal right to abstain,—

"(1) Uses violence to such other person, or his wife or children, or injures his property, or

"(2) Intimidates such other person, or his wife or children, by threats of using violence to him, her or any of them, or of injuring his property ; or

"(3) Persistently follows such other person about from place to place ; or

"(4) Hides any tools, clothes or other property owned or used by such other person, or deprives him or hinders him in the use thereof ; or

"(5) Follows such other person with one or more other persons in a disorderly manner in or through any street or road ; or

"(6) Besets or watches the house or other place where such other person resides or works or carries on business or happens to be 'Shall be liable to a fine not exceeding one hundred dollars, or to imprisonment for a term not exceeding three months.' Attending at or near or approaching to such house or other place as aforesaid, in order merely to obtain or communicate information, shall not be deemed a watching or besetting within the meaning of this section."

3. Where a person is brought before a functionary or tribunal named in the second section of the said Act of the thirty-fifth year of Her Majesty's reign, chapter thirty-one, in respect of any offence under the provisions of the first section of the said Act as amended by the second section of this Act, the accused may, on appearing before such functionary or tribunal, declare that he objects to being tried for such offence by such functionary or tribunal, and thereupon such functionary or tribunal shall not proceed with such trial, but may deal with the case in all respects as if the accused were charged with an indictable offence and not with an offence punishable on summary con-

viction, and the accused may be prosecuted on indictment accordingly; and this section shall be read as part of the said Act.

4. A prosecution shall not be maintainable against a person for conspiracy to do any act or to cause any act to be done for the purposes of a trade combination, unless such act is an offence indictable by statute or is punishable under the provisions of the Act hereby amended; nor shall any person who is convicted upon any such prosecution, be liable to any greater punishment than is provided by such statute or by the said Act as hereby amended, for the act of which he may have been convicted as aforesaid.

(2) For the purpose of this section "trade combination" means any combination between master or workmen or other persons for regulating or altering the relations between any persons being masters or workmen, or the conduct of any master or workman, in or in respect of his business or employment, or contract of employment or service; and the word "act" includes a default, breach or omission.

NOTE.—In the Dominion Revised Statutes, 1886, section 4, just above, is reduced to the following words:

"2. No prosecution shall be maintainable against any person for conspiracy to do any act, or to cause any act to be done for the purposes of a trade combination, unless such act is an offence punishable by statute."

1885.—"An Act to restrict and regulate Chinese Immigration into Canada:"

Whereas it is expedient to make provision for restricting the number of Chinese immigrants coming into the Dominion and to regulate such immigration; and whereas it is further expedient to provide a system of registration and control over Chinese immigrants residing in Canada; therefore Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows . . . . .

4. Subject to the provisions of section thirteen of this Act, every person of Chinese origin shall pay to the Consolidated Revenue Fund of Canada, on entering into Canada, the sum of fifty dollars. . . . .

5. No vessel carrying Chinese immigrants to any port in Canada shall carry more than one such immigrant for every fifty tons of its tonnage; and the owner of any such vessel, who carries any number in excess of the number allowed by this section shall be liable to a penalty of fifty dollars for each person so carried in excess.

6. Every master of any vessel bringing Chinese immigrants to any port in Canada, shall be personally liable to Her Majesty for the payment of the fee imposed by section 4 of this Act in respect of any immigrant carried by such vessel, and shall deliver, together with the total amount of such fee to the controller, immediately on his arrival in port and before any of his passengers or crew shall have disembarked, a complete and accurate list of his crew and passengers, showing their names in full, the country and place of their birth, and the occupation and last place of domicile of each passenger.

7. Every master of any vessel who lands or allows to be landed off or from any vessel any Chinese immigrant before the duty payable under the provisions of this Act has been duly paid, or who wilfully makes any false statement respecting the number of persons on board his vessel, shall, in addition to the amount of the fee mentioned in the next preceding section, be liable to a penalty of not less than five hundred dollars nor more than one thousand dollars for every such offence, and in default of payment to imprisonment for a term not exceeding twelve months; and such vessel shall be forfeited to Her Majesty, and shall be seized by any officer charged with the duty of carrying this Act into effect, and dealt with accordingly.

8. No master of any vessel carrying Chinese immigrants shall land any passenger or permit any passenger to land from such vessel, until a permit to do so, stating that the provisions of this Act have been complied with, has been granted to the master of such vessel by the controller, under penalty of one hundred dollars.

9. No controller at any port shall grant a permit allowing Chinese immigrants to land, until the quarantine officer has granted a bill of health and has certified, after due examination, that no leprosy or infectious or contagious disease exists among them on board such vessel; and no permit to land shall be granted to any Chinese immigrant who

is suffering from leprosy or from any infectious or contagious disease, or to any Chinese woman who is known to be a prostitute.

11. The controller shall keep a record of all persons to whom certificates of entry have been granted.

1889.—" The Shipping and Cargoes Act." . . . . . .

3. Section six of chapter seventy-seven of the Revised Statutes of Canada is hereby repealed and the following substituted therefor:

6. Every person who sends or attempts to send or is a party to sending a ship, registered in Canada, to sea or on a voyage on any of the inland waters of Canada, or on a voyage from any port or place on the inland waters of Canada to any port or place on the inland waters of the United States, or on a voyage from any port or place on the inland waters of the United States to any port or place on the inland waters of Canada, in such unseaworthy state by reason of overloading or underloading or improper loading, or by reason of being insufficiently manned or from any other cause whatsoever, that the life of any person is likely to be endangered thereby, is guilty of a misdemeanor, unless he proves that he used all reasonable means to insure her being sent to sea or on such voyage in a seaworthy state, or that her going to sea or on such voyage in such unseaworthy state was, under the circumstances, reasonable and justifiable; and for the purpose of giving such proof, he may give evidence in the same manner as any other witness.

2. Every master of a ship registered in Canada, who knowingly takes the same to sea, or on a voyage on any of the inland waters of Canada, or on a voyage from any port or place on the inland waters of Canada to any port or place on the inland waters of the United States, or on a voyage from any port or place in the United States to any port or place on the inland waters of Canada, in such unseaworthy state by reason of overloading or underloading or improper loading, or by reason of being insufficiently manned or from any other cause that the life of any person is likely to be endangered thereby, is guilty of a misdemeanor, unless he proves that her going to sea or on such voyage in such unseaworthy state was, under the circumstances, reasonable and justifiable, and for the purpose of giving such proof he may give evidence in the same manner as any other witness;

3. No prosecution under this section shall be instituted except by or with the consent of the Minister;

4 A misdemeanor under this section shall not be punishable upon summary conviction.

5. No grain cargo shall be carried on board any ship registered in Canada, unless such grain cargo is contained in bags, sacks or barrels, or properly secured from shifting by boards or otherwise.

(2) If shifting boards have not been used, or other proper precautions to prevent a grain cargo from shifting have not been taken, in the case of any ship registered in Canada and laden with a grain cargo, the master of the ship, and any agent of the owner who was charged with the loading of the ship or the sending her to sea, shall each be liable to a penalty not exceeding one thousand dollars, and the owner or managing owner of the ship shall also be liable to the same penalty unless he shows that he took all reasonable means to enforce the observance of this section and that he was not privy to the breach thereof.

NOTE.—Penalty under the section next preceding may be recovered upon summary conviction.

8. In every contract of service, express or implied, between the owners of a ship and the master or any seaman thereof, and in every instrument of apprenticeship whereby any person is bound to serve as an apprentice on board any ship, there shall be implied, notwithstanding any agreement to the contrary, an obligation on the owner of the ship that the owner of the ship, and the master, and every agent charged with the loading of the ship, or the preparing thereof for sea, or the sending thereof to sea, shall use all reasonable means to insure the seaworthiness of the ship for the voyage at the time when the voyage commences, and to keep her in a seaworthy condition for the voyage during the same: Provided, that nothing in this section shall subject the owner of a ship to any

liability by reason of the ship being sent to sea in an unseaworthy state, where, owing to special circumstances, the so sending thereof to sea is reasonable and justifiable.

1889.—"An Act for the Prevention and Suppression of Combinations formed in restraint of Trade."

1. Every person who conspires, combines, agrees or arranges with any other person or with any railway, steamship, steamship or transportation company, unlawfully—

(*a*) To unduly limit the facilities for transporting, producing, manufacturing, supplying, storing or dealing in any commodity which may be a subject of trade or commerce; or—

(*b*) To restrain or injure trade or commerce in relation to any such article or commodity; or—

(*c*) To unduly prevent, limit, or lessen the manufacture or production of any such article or commodity, or to unresonably enhance the price thereof; or –

(*d*) To unduly prevent or lessen competition in the production, manufacture, purchase, barter, sale, transportation or supply of any such article or commodity, or in the price of insurance upon person or property,

Is guilty of a misdemeanor and liable, on conviction, to a penalty not exceeding four thousand dollars and not less than two hundred dollars, or to imprisonment for any term not exceeding two years, and if a corporation, is liable on conviction to a penalty not exceeding ten thousand dollars and not less than one thousand dollars.

6. The foregoing provisions of this Act shall be construed as if section twenty-two of "The Trades Unions Act" had not been enacted.

1890.—"An Act further to amend the Criminal Law." Under the head of "Threats and other Offences," this Act contains the following section, viz.:

*19. Sub-section two, of section thirteen, of chapter one hundred and seventy-three of the Revised Statutes of Canada, intituled "An Act respecting Threats, Intimidation, and other offences," is hereby repealed and the following substituted therefor:

*On the 15th of April 1890, the House of Commons, being in Committee of the Whole and considering the provisions of "An Act to further amend the Criminal Law," when clause 19 was under discussion, the debate thereon was as follows, and is introduced here for the purpose of explanation:

Sir JOHN THOMPSON (Minister of Justice): On moving the second reading of the Bill I explained the object of this provision. I stated that it had been asked for by various labor organizations, who understood that the law at present was not sufficient to exempt them from punishment in the simple case of refusing to work. The present law, with respect to trade combination, is this:

"No prosecution shall be maintainable against any person for conspiracy to do any act, or to cause any act to be done, for the purpose of a trade combination, unless such act is an offence punishable by Statute."

The amendment I propose is simply this:

"No prosecution shall be maintainable against any person for conspiracy in refusing to work with or for any employer or workingman, or for doing any act, or causing any act to be done, for the purpose of a trade combination, unless such act is an offence punishable by Statute."

Mr. MITCHELL: Is it considered the law at the present time, that a combination among workingmen agreeing not to work in any particular capacity or in any particular employment, is an offence against the law? It seems to be a new offence against the law.

Sir JOHN THOMPSON: Members of trade organizations have been so advised, but that is not my impression as to what the law is. My impression is that they were not indictable for a conspiracy unless the combination was for something beyond that, and included something in the nature of intimidation, coercion, or the boycotting of a person who does work. But if there is a simple agreement among the men, in accordance with their rules, that they will not work for an employer, it does not render them liable to punishment. They have been advised accordingly, and they have also been advised to the contrary; and, under these circumstances, I think it is well to say that they are not liable for a simple refusal to work.

Mr. MITCHELL: Under these circumstances, I think there can be no great objection to the amendment proposed by the Hon. Minister. I have never understood that workingmen were liable for a refusal of work, and I am glad the Minister agrees with me, although a different opinion has been given. I think it quite proper that workmen may combine and agree among themselves that they will not work at any particular rate of wages for any particular set of individuals, if they confine the combination to that. I do not think there should be any penalty for that, and I am glad to find from the Hon. Minister that under the law there is no offence.

Sir JOHN THOMPSON: I am keeping words which are in the Statute and which in the Bill I had omitted, namely: "For the purposes of a trade combination." What I called attention to, in moving the second reading, was, that the Bill as asked for would have the effect of rendering non-punishable certain conspiracies to commit offences against the common law, although the words of the first and second lines, "Member of a trade combination," as I thought went far in restricting offences to those punishable by Statute. We have confined the wording to "does any act or causes any act to be done for the purpose of combination."

Mr. BLAKE: My opinion is that the revision of the Statutes has affected a very serious and prejudicial alteration of the law in respect to the particular class of transactions to which this law was devoted.

"2. No prosecution shall be maintainable against any person for conspiracy, in refusing to work with or for any employer or workman, or for doing any act or causing any act to be done for the purpose of a trade combination, unless such act is an offence punishable by Statute.

For my part I was apprehensive, when I saw the clause in the shape in which the hon. gentleman proposed it, and heard the reasons which he gave, that the diminished efficiency which the law has, under the Revised Statutes, would be altogether removed. I am, therefore, very glad to see that, whatever be the prefatory changes, the hon. gentleman has, at any rate, resolved to leave that diminished efficiency intact. My own impression is that the original efficiency ought not to have been impaired; that the reference to that particular class of offences with which the Revised Statutes deal, and which was originally dealt with by prior legislation, to which I shall refer, should remain and that the whole and entire vigor of the exception which was made as to statutable crimes should be preserved. In order that the position which I take on this subject may be apprehended, I will have to trouble the House with a brief reference to the Statutes as they stood. The earliest which we have on this subject is 35 Victoria, Chapter 31, passed in 1872, which was a law with reference to threats, violence and molestations It provided as to certain defined acts, which were the acts it was thought expedient to make punishable specifically—certain defined acts arising in the connection of workingmen with one another, and may be, of employers with one another—and it made these acts punishable by imprisonment with or without hard labor, for not more than three months. There were provisions in that Statute for the prosecution, under the procedure for summary prosecutions, by justices of the peace out of sessions; and a power to appeal was given. There was, also, a very proper provision that the master, or the relative, or connection of the master, should not sit as a justice of the peace in such prosecutions. That Act was not found satisfactory, and in 1875, by 38 Victoria Chapter 39, that law was repealed and other specific provision was made, which, however, in itself was unsatisfactory. In the following year, 39 Victoria, Chapter 37 (1876), was passed, for which, being at that time Minister of Justice, I happen to be responsible. Now, by the first section of that Act the Act of the previous year was repealed, and by its second section the repeal of the first section of the original Act (35 Victoria) was continued, and for it was substituted a more satisfactory section, as I conceived and as Parliament approved. That new section dealt with the matter as affecting the relations of men generally and not of particular classes of men, and it applied to these relations certain conditions which were constituted into crimes. Certain particular kinds of offences, now often called boycotting, and particular cases of a marked and defined offensive character, relating to intimidation by threat or otherwise, were specified. They were made offences, and it was provided that they should be punishable by the alternative of fine or imprisonment, summarily; but that, instead of there being an appeal, if the accused party objected to being tried before the summary tribunal, the case should forthwith be treated as an indictable offence and prosecuted as such accordingly. Then the fourth section established for the first time the law as it stood until the Revised Statutes, with reference to this particular subject of conspiracy, and its provision is that to which I particularly wish to draw the attention of the Committee and the Minister of Justice. The fourth section provided:

"That no prosecution shall be maintainable against a person for conspiracy to do any act, or to cause any act to be done, for the purpose of a trade combination, unless such act is an offence indictable by Statute, or is punishable under the provisions of the Act hereby amended; nor shall any person who is convicted under any such prosecution, be liable to any greater punishment than is provided by such Statute, or by the said Act as hereby amended, for the act of which he may have been convicted as aforesaid."

The Statute then defines what a trade combination is. Now mark that the law of conspiracy was thus swept out of all operation in connection with acts done for the purpose of a trade combination, except in two classes of cases—unless the act done was an offence indictable by Statute, or unless it was an offence punishable under this particular Act, in which case, though not necessarily an indictable offence, it was an offence of that particular character and defined in that particular way by the very Act itself, as I have described a moment ago. Therefore the law of conspiracy was abrogated, as to trade combinations, except in this particular class of offences defined, and in all cases of such graver offences as are indictable by Statute. Any conspiracy then, for purposes of a trade combination, to do an act punishable only at common law, or punishable by Statute under summary procedure, was no longer criminal and remained no longer capable of being prosecuted under the law of conspiracy. If it were one of these minor offences, not raised to the gravity of an offence indictable by Statute, if it were a minor offence punishable summarily, it was swept out of the law of conspiracy altogether if done in concert for the purpose of a trade combination. Such was the law, and so it stood and gave satisfaction until the Revised Statutes passed; but in the Revised Statutes I find an alteration was made, and reads thus:

"No prosecution shall be maintainable against any person for conspiracy to do any act or to cause any act to be done, for the purposes of a trade combination, unless such act is an offence punishable by Statute."

So that you no longer have the protection, as to the gravity of the excepted offence, which existed up to that moment. All offences which are punishable by Statute, even though of the most trivial character, and punishable in the lightest way and by the most summary procedure, are once more, by the Revised Statute drawn within the wide net of conspiracy, even though they are things done for the purposes of a trade combination. This is a distinct enlargement of the exception certainly not contemplated by me when I proposed the legislation, or by the House of Parliament, which passed it at that day; and you will readily perceive that having had a special interest in this legislation, I was surprised when I found that that diminished protection which was still awarded by the Revised Statute it was proposed further to impair by substituting offences punishable by law for "offences punishable by Statute." I am glad we are going back thus far, but I hope we shall go back still further; I hope that all the protection which was given, and advisedly given, against this obnoxious law of conspiracy by the Act of 1876 will be restored by Parliament, and that the attempt—I do not know with what design—for all I know it may not be a designed attempt to diminish that protection and to enlarge the exception—will not, now that the attention of Parliament is called to it, be persisted in, but that we shall find Parliament disposed to restore in its

1891.—"An Act respecting the Safety of Ships."

2. In this Act unless the context otherwise requires:

(*a*) The expression "ship" includes every description of vessel used in navigation, not propelled by oars or wholly or in part by steam, and registered in Canada, it includes tow-barges.

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full vigor and efficiency the Act of 1876. Now, sir, this law of conspiracy is a very wide law. I declare that the alteration which has taken place renders it impossible to say how small a matter may not now be punishable as a criminal conspiracy and introduces lamentable uncertainty into the operations of trade combinations. I have extracted a statement made by a very eminent legal authority, an ex-Lord Chancellor of England, in one of the very latest debates in the House of Lords, upon the subject of the law of conspiracy, and I will trouble the House by a perusal of it, inasmuch as it shows how wide is that net which the law of conspiracy spreads in order to catch the subject. Lord Herschell said this:

"I think exaggerated importance has been attached to the expression 'criminal conspiracy.' Many most excellent people have been guilty of criminal conspiracy without being deserving censure. The law of conspiracy is a wide net spread by the law of our country. An agreement between two people to commit a trespass is a criminal conspiracy, for it is to do an unlawful act. An agreement between husband and wife to smuggle goods into this country would make them guilty of criminal conspiracy, for it would be an agreement to do an illegal act. When I come to this subject, I get a little uncomfortable, for I am not sure that when I visited the United States I was not guilty of criminal conspiracy myself. It has been held that any combination to avoid the Maine Prohibitory Liquor Law is criminal conspiracy. I have a recollection of going to a watering place where the prohibitory law was enforced. The landlord of the hotel was not to supply spirits for payment, but promised to obtain them for his customers. There was an item in my bill under the head of 'sundries,' which covered the cost of the spirits, and I am afraid the innkeeper and I were guilty of criminal conspiracy. Any noble lord who has had experience of the criminal courts will know the length to which the law of criminal conspiracy has been carried. I am not prepared to say that any agreement to do an illegal act or to do a legal act by illegal means, is not a criminal conspiracy. There is a case which is an apt illustration of my contention that there may be criminal conspiracy, even to boycotting, without much moral blame. There is a case now pending . . . . . in which it has been held that an agreement to boycott was an illegal conspiracy; and I apprehend that every illegal conspiracy is a criminal conspiracy, because it comes clearly within the definition. That is the case of a conspiracy by highly respectable steamship companies to treat people in a certain manner and so affect their trade. Although these companies may be guilty of criminal conspiracy, I am sure they will not feel themselves morally to blame."

Now, sir, what I want to press is this: That, as the law stood as the Parliament of 1876 passed it, we abstracted altogether from the operation of the law of conspiracy all acts done in pursuance of trade combinations which did not fall within one of these two categories—First, that the act was indictable by statute and so in its nature a grave offence, and second, that the act was one of the offences specified in the statute itself and which were particularly germane to the question of trade combinations. For anything outside of these that the parties combined to do they were free from being prosecuted for conspiracy. The revision of the law has changed to the detriment of the efficiency of that protection by substituting the phrase "punishable by statute" for the phrase "indictable by statute," and has therefore permitted the application of the law of criminal conspiracy to acts trivial and minor acts done in pursuance of a trade combination, though those acts be not either indictable by statute or within the range of the specified crimes enumerated in the Act itself. What I ask the committee and the minister is that the efficiency of the protection which was given in 1876 shall be restored, and that a form of words shall be adopted which will accomplish that result.

Sir JOHN THOMPSON:—We are dealing with a class of offences in respect of which labor organizations, or, as they are known by statute, trade combinations, feel apprehensive of inefficient protection under the laws which allow them to be formed. The legislation is restricted entirely to such trade combinations. The particular case in respect of which the apprehensions of these trade combinations exist, as I stated to the committee a few moments ago, is the indictment for refusing to work with or for any employer or workman. In respect of that, the amendment which I propose completely covers the case. It declares that they shall not be liable for refusing to work with or for any employer or workman. On reviewing the clause which I had drafted for that purpose, but which was not as wide as the one I propose, the labor organizations passed resolutions and memorialized privately, by circular, members of the House, asking that the bill should be amended in the direction in which I have framed this amendment. They were willing to accept the provision in the Bill provided I substituted the word "statute" for the word "law" in the last line of section 18 (now section 19). But I have gone a step further and, in order that their request be satisfied, I propose to declare that in no case shall they be prosecuted for refusing to work with or for any employer or workman. It seems to me that in doing that I meet the practical difficulty which has arisen and I comply with the request of those who have considered this question fully for the last few years and who are most concerned in it, the trade organizations themselves; and I may say to the House that they have not merely considered it from their own point of view and their own knowledge of the law, but they have been carefully advised as to every question which might arise out of it. Under these circumstances I hope the hon. member for West Durham, after having stated the views he has expressed and having explained what his view is as to the distinction in the law prior to the revision of the statutes and now, will not press the committee to widen the provision which I state to the House, and the House will be already aware, from the requests they have had from the labor organizations, meets every practical emergency which has been suggested and meets to the fullest extent the requests made.

Mr. BLAKE:—While I retain my very strong opinion that a very important protection to the labor organizations in the exercise of their power of combination has been removed and that their position is extremely impaired, after the hon. gentleman's statement that he has had communications from the labor organizations and they have informed him that they are perfectly satisfied with this legislation, I shall not now be wiser for them than they are for themselves.

(*b*) The expression "inspector" means an inspector appointed under this Act.

(*c*) The expression "Minister" means the Minister of Marine and Fisheries.

4. The Governor-in-Council may, from time to time, appoint any port warden, harbor master, inspector of hulls and equipment of steamboats, or officer of the Marine Department, to inspect the hulls and equipment of ships. No person so appointed shall be interested in the building or construction of hulls of ships, or of any article or thing forming part of or properly belonging to or connected with, the equipment of a ship, and such person shall be termed an inspector.

5. The Governor-in-Council may, from time to time, make rules and regulations for or relating to the inspection of ships for the purpose of ascertaining whether they are in a seaworthy condition,—such inspection to comprise the hull, and the masts, spars, sails, rigging, anchors, cables, chains, boats and other parts of the outfit or equipment.

6. The master or owner of a ship, or the person in charge thereof, shall, at the earliest opportunity after the occurrence of any event whereby the hull, masts and spars or equipment of any part of the same is, in any material degree, injured, strained or weakened, report such occurrence to an inspector or the collector of customs, and in case of omission to so report, the owner of the ship shall incur a penalty not exceeding one hundred dollars, and such ship shall be liable for such penalty.

Mr. LAURIER :—It seems to me that the labor organizations scarcely apprehend the distinction which has just been proposed by my hon. friend from West Durham. It is certainly a very important difference, though technical, and probably on that account overlooked by the organizations, and if the attention of the organizations had been called to it they would have been only too gald to avail themselves of the more stringent protection suggested by my hon. friend.

Sir JOHN THOMPSON :—The very section which is now proposed—and I ought to have mentioned it sooner out of deference to the hon. member for West Elgin—is the proposition he submitted to the House last year ; I think he did so at the request of the labor organizations. I know that after the Bill was introduced by him delegates from the labor organizations waited upon almost every member of the House and requested their support for the Bill. But the Bill was not introduced early enough to reach all its stages. Delegates from a number of these labor organizations met members at the beginning of the session and requested that some such clause should be adopted. I proposed the clause which is in the Bill and they distinctly agreed to that as sufficient for all their purposes. Since the Bill was introduced they have issued a circular to which the hon. member for Montreal (Mr. Curran) drew my attention yesterday and a copy of which I received this morning. That circular contains the following resolution :

"Be it resolved that we ask that Sir John Thompson's Bill to further amend the Criminal Law be amended by inserting the word 'statute' in place of 'law.'"

In addition to that some eight or ten delegates representing all the trade and labor organizations waited upon the First Minister, the Minister of Agriculture, the Minister of Marine and myself, the other day and made the request that the simple change should be made in my Bill of inserting the word "statute" for "law." I think the section I have proposed will be an improvement and gives them further protection even than that ; but considering, as the hon. member for Durham has said, that it meets the request put forward by these organizations and, as far as I can see, meets all practical difficulties, it would be well to rest content with that much for the present, at any rate, unless a practical case is put forward calling for a change.

Mr. CURRAN :—Judging by the observations of the hon. member for West Durham (Mr. Blake) it would appear as if there will not be as much protection as formerly. What we must also take into consideration is the fact that these organizations are advised by legal gentlemen outside whose views are very different to those expressed by hon. gentlemen here. I have often, myself, when conversing with those people, found that points which appeared very clear to me were taken exception to by them under advice given them elsewhere. The Hon. the Minister of Justice has met the request of these people on their own ground and, perhaps, to some extent improved upon it. It is probably well to give them what they ask.

Mr. BLAKE :—When I was called upon to legislate upon this subject, I gave what I thought was right.

Sir JOHN THOMPSON :—I have given not only what I thought was right but more than they asked and do not propose to give any more.

On Wednesday, April 19th, Hon. Sir John Thompson moved the third reading of Bill No. 65, further to amend the Criminal Law.

Mr. BLAKE :—I wish to direct attention for a moment to another description of concerted action than that to which our attention has been directed this afternoon. I refer to the provision with reference to trade combinations. It is not my intention to engage in the fruitless task of pressing my views to a division, but I will simply take occasion to record them I move the following amendment :

"That the Bill be not now read the third time, but that it be referred back to the Committee of the Whole with power to amend the eighteenth section by omitting the proposed substituted sub-section of section 13, chapter 173 of the Revised Statutes of Canada, and inserting in lieu thereof the following :

"No prosecution shall be maintainable against any person for conspiracy in refusing to work with or for any employer or workman, or for doing any act, or causing any act to be done for the purposes of a trade combination, unless such act is an offence indictable by statute, or punishable under the provisions of the 12th section of this Act." Amendment negatived.—Hansard (1890), Vol. II., page 3460.

7. Every inspector may, for the purpose of inspecting, at any time go on board of any ship liable to inspection under this Act, and inspect or examine the same and every part thereof, and the machinery, equipment and cargo, and may require the unloading or removal of any cargo, ballast or tackle, and may ask of any or all of the owners or officers of such ship, or other person on board thereof and in charge or appearing to be in charge thereof, such pertinent questions concerning the same, or concerning any accident that has happened thereto, as he thinks fit, and every such person shall fully and truly answer every such question so put to him, and every person who refuses to answer, or falsely answers, such question, or who prevents any such inspection, or obstructs or impedes any inspector in making such inspection, or who, being in charge, refuses to render such inspector reasonable assistance in making such survey or examination, shall incur a penalty of two hundred dollars.

8. Every inspector may, at any time, visit any ship, whether registered in Canada or elsewhere, and whether propelled wholly or in part by steam, and inspect and examine the tackle, machinery, or apparatus used for the loading or unloading thereof, and if he considers such tackle, machinery, or apparatus defective so as to be dangerous to life he shall report thereon to the Minister, who may order that such tackle, machinery and apparatus shall not be used until permitted by the Minister, and any tackle, machinery or apparatus used in violation of such order shall be liable to forfeiture and seizure by the chief officer of customs at any port, and may thereupon be sold in the same way and under like provision as goods liable to forfeiture for non-payment of customs duties, and the owner of the ship shall incur a penalty of one hundred dollars, and such ship shall be liable for such penalty.

14. This Act shall be construed as enacted in addition to and not in derogation of chapter seventy-seven of the Revised Statutes intituled "An Act respecting the Safety of Ships and the Prevention of Accidents on Board thereof," and the amendments thereto.

15. The foregoing provisions of this Act shall come into force on a day to be named by Proclamation of the Governor-in Council in any place or places or within such limits in Canada as are in such Proclamation designated.

TRADE UNIONS IN GREAT BRITAIN.

According to a Return made to the Imperial Parliament by the Registrar of Trade Unions in Great Britain, for the year 1891, and ordered printed by resolution of the House of Commons, dated 5th April, 1892, the total number of registered trade unions in Great Britain in 1891 was 590. Of this number 493 were in England and Wales, 43 in Scotland, and 54 in Ireland.

In England and Wales, of the 493 unions, 173 made no returns. Of Scotland's 43 only 1 failed to make a return, while in Ireland 15 out of the 54 neglected their duty in this particular. Of the 320 unions in England and Wales making returns, 105 had each a membership of 1,000 and upwards; 33 had each a membership ranging from 500 up to 1,000; while the remaining 182 ran from 10 up to 500 each.

In Scotland, 16 of the total 43 unions had each a membership running upwards from 1,000; 9 ranged from 500 to 1,000, and the membership of 18 varied between 44 and 500.

In Ireland, of the 39 unions making returns only 4 had each a good-standing roll of 1,000 and upwards, 3 running over 500 members each, and 32 with from 10 to 500 members.

The following table contains the titles of the unions in each country with a membership of 1,000 and upwards, as well as the income, funds on hand and expenditure of each for the year ending Dec. 31, 1891:

TRADE UNIONS IN GREAT BRITAIN IN 1891 WITH A MEMBERSHIP OF 1,000 AND UPWARDS.

Name.	Funds. 31st Dec. 1891.	Income for 1891.	Expenditure for 1891.	Number of Members.
In England and Wales—	£	£	£	
Operative Bricklayers' Society, London	43,995	26,102	22,974	17,058
United Society of Boilermakers and Steel and Iron Ship Builders, Newcastle-on-Tyne	183,635	112,077	77,295	36,996
Am. Society of Railway Servants of England, Ireland, Scotland and Wales	110,584	35,279	22,809	29,820
Power Loom Carpet Weavers' Mutual Defence and Provident Association, Kidderminster	11,136	2,113	1,986	1,348
Durham County Colliery Enginemen's Mutual Aid Society, Durham	4,430	1,556	1,112	1,678
London and Southern Counties Labor League and Kent and Sussex Union, Deptford, Kent	5,347	10,984	11,566	13,000
Yorkshire Miners' Association, Barnsley, Yorkshire	117,822	67,455	19,278	52,000
Durham Miners' Association, Durham	55,407	56,067	49,049	55,000
Liverpool Operative Ship Painters' Association	946	977	817	1,002
Am. Society of Carpenters and Joiners	70,936	88,771	84,194	34,779
Am. Society of Tailors	10,925	25,057	28,740	17,573
Am. Society of House Decorators and Painters	2,746	3,345	2,840	3,055
National Association of Operative Plasterers	3,921	5,048	3,536	5,554
Am. Association of Operative Cotton Spinners, Self-actor Minders and Twiners of Lancashire and adjoining Counties	115,243	57,429	38,611	19,662
West Bromwick, Oldbury, Tipton, Coseley and Bradley Amalgamated Association of Miners, Staffordshire	2,634	8,002	2,808	2,603
Bristol, West of England and South Wales Operative Trades and Provident Society, Gloucestershire	3,033	5,116	4,481	5,021
Steam Engine Makers' Society, Manchester	28,377	15,660	11,936	5,965
National Agricultural Laborers' Union, Warwickshire	11,145	3,675	2,950	15,000
Durham Coke Men and Laborers' Association	982	1,939	1,718	3,045
Skelmersdale District Miners' Association	2,380	1,498	564	1,671
North Wales Quarrymen's Union, Carnarvon	2,333	654	403	5,710
General Union of Operative Carpenters and Joiners, Liverpool, Lancashire	1,542	5,653	5,325	2,564
Am. Society of Mill Sawyers and Wood Cutting Machinists, Newcastle-on-Tyne	1,876	2,384	1,801	1,505
Northumberland Miners' Mutual Confident Association	23,682	11,101	3,531	19,001
West Cumberland Miners' Association	756	1,956	2,245	3,481
Am. Society of Operative Lace Makers, Nottingham	9,649	9,345	6,938	3,200
Iron Dressers' Trade Society, Manchester	1,912	2,169	2,397	1,010
Union Society of the Miners of Rohsllanerchrugog, Wales	492	359	58	1,232
National Federation of Enginemen's Protective Association, Durham	28	51	53	5,206
North Yorkshire and Cleveland Miners' Association	2,826	1,345	780	4,134
Friendly Associated Male and Female Card and Blowing Room Operatives' Association, Lancashire	846	1,701	1,690	1,258
Bradford and District Amalgamated Society of Dyers, Yorkshire	1,019	1,274	1,114	1,801
Miners' Improvement Benefit Society, Lancashire	1,870	1,149	683	1,588
Durham Colliery Mechanics' Association	1,649	2,341	2,087	3,609
London Society of Compositors	2,525	19,304	21,762	9,350
Am. Society of Boot and Shoe Makers, Middlesex	2,271	3,008	2,635	5,526
Associated Society of Locomotive Engineers and Firemen, Yorkshire	20,731	10,709	4,934	6,200
Liverpool Shipwrights' Trade and Friendly Association	1,558	1,908	1,691	1,365
Ashton, Bolton, Haydock, etc., Miners' Trade Union, Lancashire	382	4,239	4,369	13,354
Cleveland and District Blast-furnacemen's Association, Yorkshire	106	1,075	1,869	2,444
Liverpool Operative House Painters' Old Society	1,610	1,000	584	1,250
West Riding of Yorkshire Power Loom Weavers' Association	809	1,413	1,309	4,500
Amalgamated Society of General Toolmakers and Machinists, Birmingham	1,421	1,490	1,262	1,200

TRADE UNIONS IN GREAT BRITAIN.—*Continued.*

Name.	Funds 31st Dec., 1891.	Income for 1891.	Expenditure for 1891.	Number of Members.
In England and Wales—*Continued.*	£	£	£	
Friendly Society of Ironfounders of England, Ireland and Wales	53,022	49,015	43,847	15,291
United Operative Plumbers' Association of Great Britain and Ireland	4,691	7,435	7,693	5,549
Nottinghamshire Miners' Association	10,242	6,856	2,026	18,341
Amalgamated Society of Engineers	237,251	189,774	192,032	71,221
Leicester and Leicestershire Am. Hosiery Union		6,016	7,362	3,887
Blackburn Power Loom Weavers' Protective Society, Lancashire	2,113	1,767	1,289	2,384
National Union of Boot and Shoe Operatives, Leicester.	17,310	28,992	25,099	43,483
National Union of Life Assurance Agents, Manchester.	39	644	619	1,179
National Amalgamated Society of Operative House and Ship Painters and Decorators, Manchester	6,087	6,369	4,728	4,140
Warwickshire Miners' Association	2,904	2,197	1,123	3,256
Pellsall District Miners' Association, Staffordshire	2,608	2,641	1,447	5,492
Oldham Provincial Card and Blowing Room Operatives' Association	5,930	9,920	6,748	10,126
Coalville and District Miners' Association, Middlesex.	3,699	2,202	745	3,235
Friendly Society of Operative Stonemasons of England.	8,897	18,320	14,906	14,090
Associated Iron and Steel Workers of Great Britain	5,242	5,180	4,778	8,415
National Union of Quarrymen	210	193	49	1,388
Am. Society of Lithographic Printers of Great Britain.	3,137	3,740	3,215	2,502
Dock, Wharf, Riverside and General Laborers' Union of Great Britain and Ireland	6,809	19,344	18,820	30,000
National Association of Blastfurnacemen, Yorkshire		641	641	7,000
National Amalgamated Sailors and Firemen's Union of Great Britain and Ireland	8,202	34,490	57,296	20,000
Coal Trimmers' Protection and Benefit Society, Glamorganshire	649	697	546	1,035
London Printing Machine Managers' Trade Society	4,764	2,862	2,431	1,450
Monmouthshire and South Wales District Miners' Association	217	649	515	3,260
National Steel Workers' Association, Engineering and Labor League, Durham	111	1,194	1,622	1,605
Associated Shipwrights' Society, Northumberland	23,787	14,599	7,500	10,120
London Carmen's Trades Union	138	1,182	1,226	3,700
Pendleton Miners' Association and Check Weigh Fund, Lancashire	3,624	5,779	3,894	3,100
London District of the Amalgamated Union of Operative Bakers and Confectioners	690	2,351	2,281	1,870
Amalgamated Union of Operative Bakers and Confectioners of Great Britain and Ireland	1,366	2,052	1,753	4,000
South Derbyshire Amalgamated Miners' Association	1,994	1,781	788	2,998
Shipwrights' Provident Union of the Port of London.	8,102	2,289	1,813	1,398
Dalton and District United Workmen, Lancashire	1,262	937	492	2,142
National Society of Amalgamated Brass Workers, Warwickshire	4,521	6,788	6,083	6,005
National Union of Gas Workers and General Laborers of Great Britain and Ireland	3,834	15,532	17,169	35,719
Tyneside and National Labor Union, Northumberland.	9,544	13,019	11,304	25,200
Winsford Salt Makers' Association, Cheshire	3,203	1,013	815	1,548
United Kingdom Society of Amalgamated Smiths and Strikers	2,320	2,677	2,009	1,584
Northern Counties' Amalgamated Association of Tramway and Hackney Carriage Employees	984	1,205	743	2,424
National Amalgamated Coal Porters' Union of Inland and Sea-borne Coal Workers, London	679	2,780	3,102	5,000
Norwich and District Amalgamated Society of Salt Workers, Alkali Workers, Mechanics and General Laborers, Cheshire	1,985	1,239	463	1,803
Printers' Laborers' Union, London	947	1,051	516	1,200
Am. Society of Enginemen, Cranemen, Boilermen and Firemen, Yorkshire	210	2,001	2,096	3,495
Mersey Quay and Railway Carters' Union, Liverpool.	2,248	2,180	1,382	2,780
Millers' National Union, Surrey	543	1,007	878	1,600

TRADE UNIONS IN GREAT BRITAIN.—*Concluded.*

Name.	Funds 31st Dec., 1891.	Income for 1891.	Expenditure for 1891.	Number of Members.
In England and Wales—*Concluded.*	£	£	£	
Federation of Salt Workers, Alkali Workers, Mechanics and General Laborers, Cheshire	621	423	151	1,892
Amalgamated Society of Gas Workers, Brickmakers and General Laborers, Warwickshire	685	1,141	765	3,152
National Association of Builders' Laborers, Warwickshire	967	1,511	852	3,321
United Builders' Laborers' Union, Surrey	319	421	270	1,300
Bristol Miners' Association, Gloucestershire	3,323	4,084	2,983	3,356
South Side Labor Protection League, Surrey	98	905	928	2,250
Amalgamated Protection Union, Middlesex	108	949	1,157	2,078
Eastern Counties Labor Federation, Suffolk	152	478	329	8,409
Electrical Trades' Union, Middlesex	473	760	543	1,123
Am. Protective Union of Engine Drivers, Crane Drivers, Hydraulic and Boiler Attendants, Essex	374	467	380	1,042
Navvies, Bricklayers' Laborers and General Laborers' Union, Middlesex	209	702	610	1,500
Amalgamated Seamen and Tradesmen's Union of Great Britain and Ireland	119	901	782	4,520
National Federation of Fishermen of Great Britain and Ireland	383	1,478	1,317	2,938
South-east Lancashire Provincial Card and Blowing Room Operatives' Association	2,244	3,963	2,601	2,905
National Municipal and Incorporated Vestry Employees' Labor Union, Surrey	182	696	610	3,377
Wigan Miners' Association, Lancashire	5,901	1,555	1,162	6,592
United Kingdom Theatrical and Music Hall Trade Union, Middlesex	564	845	560	2,000
In Scotland—				
Associated Blacksmiths of Scotland	8,215	5,443	3,831	2,379
United Engine-keepers' Mutual Protective Association of Scotland	640	762	676	1,212
United Pattern Makers' Association	10,342	6,587	4,048	2,314
Forth and Clyde Valleys Miners' Association, Glasgow	613	834	1,271	1,275
British Steel-workers' Am. Society, Glasgow	1,645	4,396	7,329	2,917
Associated Iron Moulders of Scotland	31,002	21,135	15,625	6,121
Amalgamated Hammermen, Glasgow	362	671	585	1,400
Associated Society of Millmen, Glasgow	1,949	1,320	2,088	1,104
Operative Bakers of Scotland	371	803	504	2,157
Central Ironmoulders' Association of Scotland	2,555	1,405	270	1,254
Associated Scottish Iron Ship-builders Helpers' Trade Unions	1,943	1,702	684	2,000
National Laborers' Union, Glasgow	391	1,029	991	1,941
Sewing Machine Makers' Trade Union, Glasgow	443	698	588	1,044
National Scottish Horsemen's Union, Glasgow	39	177	153	1,439
National Union of Dock Laborers in Great Britain and Ireland	435	7,940	8,553	13,000
Scottish Shop-keepers and Assistants' Union	1,305	1,331	1,128	1,380
In Ireland—				
Flax Dressers' Trade and Benevolent Union, Belfast	2,098	2,114	1,543	1,349
Belfast Operative Plasters' Protective and Friendly Trade Union	509	336	193	1,801
Dublin United Builders' Laborers, now called United Laborers of Ireland	100	970	1,155	1,275

DOMINION TRADE CONGRESS.

The Annual Report of the Bureau of Industries for the Province of Ontario, 1886, contained a chapter each on "Laws to Assist and Protect the Working Classes" and "Labor Organization in Ontario." Under the last-mentioned heading, brief reference was made to the several Trade and Labor Congresses held in Canada from 1873 to 1886, both years inclusive, and the general trend of the deliberations at each Congress.

Third Meeting, Hamilton, Ont.

In 1887 the Dominion Trades and Labor Congress met in the city of Hamilton in September of that year. Credentials showed forty-five delegates, representing thirty-three different labor organizations, present on the occasion. The total receipts for the year were $230, and the expenditure only $147.88, leaving a cash balance on hand of $82.12.

The retiring President, in an address surrendering his office, recommended "that a Standing Parliamentary or Legislative Committee be provided for" at that session, and that the funds requisite to enable it to do its duty, adequately and effectually, be provided in such manner as to the Congress may seem best. He also advised as follows: "While trusting that none of the questions acted upon by each or any Congress of the past will be lost sight of, but rather that such action will be reiterated where requisite, I recommend careful consideration as to the advisability and prudence of centering all the efforts of organized labor upon an agitation for the achievement of success in a few specified and most urgent cases, prior to and during each session of the respective Parliaments, rather than urging all questions at one and the same time, and thereby weakening the position of those most interested." At a subsequent stage of the Congress both recommendations were concurred in, and the requisite machinery provided to give full effect thereto.

Some sixty-five resolutions of more or less importance to the cause of those who work for wages were concurred in during the three days' session of the Congress. Among these may be specially mentioned resolutions in favor of taxing land values; petitioning the Federal Parliament to pass a law compelling all vessels, whether steam or sail, navigating the inland waters of Canada, to carry competent crews of men; making it compulsory that hulls and rigging be inspected by competent men appointed for that purpose, and to stop the loading of vessels below a certain mark to be designated by said Inspector; in favor of an amendment to the municipal law to provide that all householders shall have a right to vote on all money by-laws; that every contract as between any of the Governments of Canada and contractors for public works should contain a clause declaring that no employee of any contractor, while employed upon the work so contracted for, shall be asked or compelled to work more than eight hours per day, and five hours on Saturday, under penalty of forfeiture of contract; that any insolvency law should contain a provision giving labor a priority of claim for wages of sixty days at least;* for the abolition of the Senate of Canada; that some mark or designation be placed upon prison-made goods to inform intending purchasers that they are such; against the monopolization of public lands by corporate companies and individual speculators; the removal of all tax exemptions, through Dominion and Provincial legislation; in favor of a Federal workshops regulation act; in favor of working people being represented in the Parliaments of the country "by men of their own class;" that it is the imperative duty of the Governments to peremptorily abolish the existing immigration system and that due care should be exercised in preventing the introduction of certain classes into Canada, whether they be sent under the authority of the Imperial Government or through any other channel; that the office of Lieutenant-Governor in the Dominion of Canada be abolished, and that the office of Governor-General be filled by popular vote; that the present law for the collection of debts is oppressive, inasmuch as it allows goods to the value of many times the amount of a debt to be seized and sold in satisfaction of a judgment; that any terms or stipulations other than the rendering of an equivalent for wages insisted upon or demanded by

* Note.—An Ontario Statute, "An Act respecting Wages," 48 Vict. cap. 29, and as amended by Act of the session of 1892, gives priority to the amount of three months' wages to such creditors, and they shall be entitled to share *pro rata* with such other creditors as to the residue, if any, of their claims in cases of assignment, seizure under execution by the Sheriff, etc.

employers in the engagement of employees, be declared by law null and void, and that any attempt at their exaction be declared a criminal offence, punishable by imprisonment for a specific period on proof and conviction in a court of competent jurisdiction; approving of the principle of co-operation, and recommending the adoption thereof both as to production and distribution; that so long as the contract system continues whenever tenders are called for by either Federal or Provincial Governments, or by any municipality for the building of any public work, or the performance of a public service, and where in the building of such work or performance of such service workmen will be employed belonging to a trade or calling in which there is a usual and commonly recognized scale of wages, none should be allowed to tender who have at any time in the preceding twelve months paid less than the standard wages in such trade or calling; in favor of a Dominion Factories Act, and an amendment of the British North America Confederation Act, so as to secure that end; in favor of the abolition of the system of voting for municipal officers and councillors in other wards than that in which the voter resides; that as the evils of intemperance are so clearly manifest in their effects in all classes of society, any practical effort to reduce the consumption of intoxicating liquors will meet the hearty support of organized labor, as represented in this Congress; in favor of the abolition of the contract system in respect of all National, Provincial and Municipal works, and the substitution of a system of performance of such work under the direct supervision of governments themselves; in favor of legislation prohibiting municipalities granting bonuses to manufacturing industries; in favor of a law compelling cities, towns and other municipalities to publish annual assessment rolls; in favor of grouped constituencies and a cumulative vote in parliamentary and legislative elections; that all lands held by individuals in excess of 150 acres, not under cultivation, be taxed to the full value of cultivated land of like character; in favor of election of police commissioners by the ratepayers; affirming the principle of arbitration in labor difficulties that cannot be settled otherwise; protesting against Government employees being allowed to work for private individuals and contractors while under salary, and holding that such officials should receive sufficient pay to enable them to avoid the necessity of working extra hours or competing in the labor market, and that the Congress considers that the present Municipal Act should be so amended as to have the election of school trustees take place on the same day as the municipal elections.

Fourth Meeting, London, Ont.

1888.—This year the annual session of the Dominion Trades and Labor Congress was held in London, Ontario, in September, the use of the City Hall being secured for the occasion. There were forty-one delegates present, on behalf of twenty-eight labor organizations. The receipts of the past year amounted to $349.89, while the total expenditure was $287.98.

The President outlined the principal work of the Congress on this occasion, when in his fourth annual address he said:

"Without entering upon a review of what has been attempted or effected through legislation during the past year in the Dominion Parliament or in the Provincial Legislatures of Canada, in so far as the same affected the direct interests of wage earners, and without losing sight of the very great importance of each and every matter passed upon at your session of 1887, I feel justified in drawing your special attention, with the design of securing prompt remedy in the matters of the opening and working the Welland Canal on Sunday; the present immigration system of the Dominion; the laws governing masters and mates, as well as those bearing upon steam engineers on vessels of the inland marine of Canada; the existing law and its inadequacy in affording suitable protection to railway employees; Sunday work upon railways; the necessity of amending the existing very deficient, and consequently useless, provincial arbitration law of Ontario; the advisability of investing police magistrates and justices of the peace with power to examine and punish judgment debtors in cases involving the payment of wages to employees; the appointment of a female factory inspector in Ontario, and, lastly, the advisability as well as justice of exempting from taxation all dwelling houses in the sum of at least $600.

"Impressed as I am with the seriousness and importance of the interests and principles involved in these questions, I strongly recommend prompt and unmistakable action on the part of your body and its constitutents on these subjects to which I have just referred."

Later on in the session the Congress concurred in the recommendations above referred to and went upon record thereon in a series of appropriate resolutions in respect thereto. Beyond this, the session was devoted to a reiteration of such resolutions of previous sessions of the Congress as had not found accomplishment in the laws of the country.

Fifth Meeting, Montreal, Que.

1889.—In the City Council Chamber, on the 3rd of September, 1889, Ald. Rolland, chairman of the Finance Committee of the City Council, in the absence of Mayor Grenier, welcomed the members of the Congress to the city of Montreal. He said he considered it an honor to be asked to address such an important body. With regard to meetings of the Congress, he hoped what was accomplished would be to the benefit of the working classes as well as the manufacturers employing hands He, as an employer, took a very great interest in the working classes, and was pleased to notice signs of improvement as well as to see all nationalities working harmoniously together for the benefit of all. He believed that everyone would watch the work of this Congress with great interest. He hoped whatever resolutions might be passed by the Congress would have the good effect desired of promoting the welfare of the working classes.

President J. T. Carey, in acknowledging the courtesy of the City Council, and in reply to the remarks of Alderman Rolland, said it was very gratifying to the representatives of many different bodies of workingmen to receive such a cordial welcome. He might remark that the Congress did not mean that workingmen were banded together to do anyone injury, but for the purpose simply of bettering their own condition. The Congress was to a great extent an educational organization, as it was believed that only by educating the masses could the ends desired be obtained—that is obtained without trouble. He believed Ald. Rolland's wishes would be carried out by the Congress, which, he promised, would do its best not to deviate from the lines laid down. He was pleased to notice a general fraternal feeling existing, and desired that the French-Canadian delegates had his very best sympathies, and he hoped all would work hand-in-hand for the common cause.

There were credentials for eighty-three delegates reported favorably, while the credentials of two delegates from the Montreal Single Tax Association were not accepted, that organization not coming under Section 7, Article 2, of the Constitution which provides that:

"This Congress shall be composed of delegates from Trades' Councils, Central Labor Unions, Trade Unions, and State, District and Local Assemblies of the Knights of Labor in the Dominion of Canada."

These eighty-three delegates represented forty-seven organizations, including five Trade and Labor Councils and five District Assemblies of the Knights of Labor.

Including $50.91 cash in hand at last annual audit, the gross receipts for the past year were $370.30, and the total expenditure, $313.04, leaving a balance on hand of $57.26. Received after close of audit, $25.

President Carey, in his address declaring the Congress open for regular business, felt it incumbent to say, among other things:

"Fellow Delegates,—As President of the Dominion Trades and Labor Congress during the past year and at the present time, it is with more than passing gratification that I find it my privilege, as it is my very pleasing duty, to extend to you, individually and collectively, at this time, a hearty welcome to the great commercial city of Montreal. My pleasure is the greater because this is the first occasion on which an inter-Provincial gathering of this character has been summoned to meet in the Province of Quebec.

"Anticipating, as I do, that each and every one of you, in your respective provinces have been sufficiently interested to keep a close eye on all business of interest to wage-earners introduced either in the Federal Parliament at Ottawa or in the provincia legislatures, I do not deem it necessary to refer to such legislation in other than general terms. My experience and observations lead me to the conclusion that much that is

required, whether in the passage of new laws or in the beneficial amendment of some already on the statute books, both federal and provincial, may and can be achieved through intelligent agitation and united perseverance on the part of organized labor throughout the Dominion. To secure the one and counsel the other in your respective localities—while always advising your constituents to avoid, and at the same time carefully note, the many side-issues and crafty schemes of those who would but use them for party political purposes or for personal preferment—should be the especial duty of every delegate, and I hope it will be a prominent part of the work of the present Congress. Looking to that laudable end, I especially recommend that a change be made so that the Executive Committe of the Congress be composed of six persons—three from the Province of Ontario and three from the Province of Quebec—with the President of the Congress as chairman. By this arrangement, while acting as an Execution Committee for the Congress, each three referred to would also be empowered to act as a sub-committee in supervising as well as promoting such legislation of a purely provincial character as may be outlined by this body or its executive, or which may be promoted or asked for by labor organizations within either or both provinces in the interim between the yearly meetings of the Congress." . . . . . .

This session of the Congress lasted during four days and among the new resolutions and matters dealt with and concurred in were the following, viz. :

"That the system of subsidizing railways, by land and money grants, is detrimental to the best interests of the the country, and that this Congress request the Government to discontinue said practice, but when need arises the Government shall provide facilities to the citizens of this country to exchange their products with each other, and not delegate this important duty to private corporations ;

"That the Government establish offices where the workingmen out of employment could go and inquire to obtain employment ;

"That, in the opinion of this Congress, the interest of the female workers requires that female inspectors of factories and workshops should be appointed by the Government, and that in order that the duties of such female inspectors, when appointed, shall not be performed in a perfunctory manner, the wishes of the various labor bodies should be consulted in making such appointments ;

"That this Congress petition the Dominion Government to amend sub-section 2 of Section 13 of Chapter 273, Revised Statutes of Canada, so that said section shall read 'that no prosecution shall be maintainable against any person or persons for conspiracy for refusing to work with or for any employer or workman, or for doing any act or causing any act to be done for the purpose of a trade combination, unless such act is an offence punishable by statute';

"Whereas land is necessary to life and to the exercise of labor ; whereas no generation of men has a right to sell forever the land that must needs be used by all succeeding generations ; and whereas the immense land grants of recent years, by which vast tracts of the public heritage have been ceded to railway and other corporations, are very injurious to the common weal ; and whereas land speculation, so rapidly developing in our cities, is enormously increasing the rents paid by all who require to use land ; and whereas the value of land, which is created not by individual labor but by the growth of population—that is by the whole community—belongs to the people in the same manner as the product of the labor of each individual belongs to him ; and whereas the withholding of land from use causes a perpetual congestion of the labor market : therefore be it resolved that this Congress, representative of Canadian workmen, hereby expresses its approval of the Henry George land reform system, and resolves to take all lawful measures for the promotion of land nationalization by the means of the taxation of land to its full annual rental value, irrespective of improvements ; and, further, that we call upon the farmers of this country—our co-workers—to aid us in our endeavors to thus lighten the taxation of labor, and place public burdens upon the almost untaxed fruits of the land speculator ;

"That this body strongly advocates eight hours as a day's work, and urges that all Government and Municipal work be done on the same basis ;

"Whereas, among other serious grievances calling for the enactment of a Workshops Regulation Act, is the spread of the pernicious sweating system in the tailoring trade in this country, bringing in its wake social, physical and moral degradation to the employees, therefore be it resolved that this Congress petition the provincial legislatures to pass a Workshops Regulation Act with strict provisions as to the sanitary condition of all workshops and dwellings in which any kind of labor (except household) is performed, and the appointment of inspectors to strictly enforce such provisions;" * and

"That the constitution be amended in accordance with the recommendation of the of the President."

Sixth Meeting, Ottawa, Ont

1890.—The Congress met in City Council chamber in the city of Ottawa on September 2, 1890. His Worship Mayor Erratt tendered the delegates an earnest and hearty welcome to the capital, and expressed the hope that their stay in the city would be pleasant and profitable. "I am delighted," he said, "to have witnessed the grand celebration by which Labor Day was observed" (the day before.) "It was the first celebration managed exclusively by workingmen in this city. I never remember seeing so large or so well ordered a parade in Ottawa before. It was a most respectable and creditable turnout."

President J. T. Carey, on behalf of the Congress, thanked the people of Ottawa, through their Mayor, for the kindness and hospitality shown to the visiting delegates; and expressed the hope that this annual meeting would be, as others of the past had been, productive of great good to the laboring men and to all the people of Canada. Then, turning his words to the delegates, he told them they were there to perform duties imposed on them by the organizations which had elected them, and he knew that the great trust would be faithfully kept. He hoped they would carry home with them the most kindly and fraternal feeling towards each other and towards all with whom they came in contact.

When the Congress went into regular session, the credentials of 90 delegates were reported as correct, and these represented 62 different labor bodies.

The gross cash receipts for the year were $562.13, while the total expenditure was $477.76, leaving a balance on hand of $84.37.

The Audit Committee reported that the financial report presented the Congress was correct in every particular; and called special attention "to the gratifying fact that the number of organizations which support the funds of the Congress have increased a little over one hundred per cent. within the last year."

The Standing Orders Committee, to whom was referred the President's address, reported concurrence in the recommendations therein made to the effect that it is advisable to keep an accredited representative of organized labor at the capital during the sessions of the Dominion Parliament, and that the system should be continued of having on the Executive Committee three members from each of the Provinces of Ontario and Quebec, who shall be charged with the duty of watching legislation affecting the working classes in these provinces, and it was so resolved by the Congress.

On the second day the following communication from the Victoria (British Columbia) Trades and Labor Council was read, and, on motion, referred to a special committee, viz.:

Victoria, B.C., Aug. 25th, 1890.

To the President and Members of the Dominion Trades and Labor Congress:

Gentlemen,—At the last meeting of the Victoria Trades and Labor Council I was instructed to convey to you the regret which the Assembly feels at not being represented in your Congress, and also to pledge our best wishes that the fruit of your deliberations may be equal to your desires.

It was also thought that it would be well to draw your attention to the great additions which have recently been made to Canada's already too large Chinese population. This influx, of course, can, in a great measure, be attributed to the exclusion laws recently adopted by the United States, but at the same time it is evident that British Columbia

capitalists encourage Chinese immigration, to the great detriment of dignified white labor. The channels through which white men should derive subsistance are being gradually but surely choked by the Chinese, and their influence on the labor market is evident in every direction. Their influence on the morals of the young white population is another phase of the question which should not be permitted to escape unnoticed. Thousands of young men on the Pacific Coast who are now wrecks physically and mentally, can lay their ruin to the Chinese, who taught them the terrible habit of opium smoking. The practice has become so common as to cease to be a matter of wonder or horror. Surely the Dominion Government is not so dead to the future of Canada as to allow these things to continue. Legislation as exclusive as that adopted by the Australian colonies would have the desired effect. Just so soon as the trouble now existing in the Wellington collieries is brought to a termination the Victoria Trades Assembly proposes to take the Chinese question up with a view of inducing legislation on that subject, for it is only in legislation that the rights of white labor will be preserved. The feeling among Victoria organized laboring men is strongly in favor of a restricted immigration law made applicable to all countries. This, they believe, would be only a just recognition of the rights of Canada's working classes.

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DAVID M. CARLEY, Secretary, V. T. A.

During this Congress, among the important resolutions adopted were the following: Requesting the Government to make Labor Day a national holiday; praying for such Dominion legislation as will have the effect of prohibiting the importation into Canada of Chinese labor, and preventing the further admission, under any circumstances, of any of this undesirable class of immigrants; and also that the employment of Chinese laborers in mines should be prohibited by law and a penalty of $500 for each offence enforced against owners of all mines in which such labor is employed; that the Federal Government should assume possession of the railways, telegraphs and telephones of the country, at a valuation to be made by competent arbitrators, and operate them in the public interest; that as the Government of the Province of Quebec allowed strangers a bonus on settling on Crown lands, a petition be presented asking the extension of a like privilege to workingmen of the province so as to faciliate their settlement on such lands; praying for material increase of grants for primary education in Public and Separate schools so as to maintain and increase their efficiency; praying the Dominion Government to consider the advisablity of increasing the rural population of the country by by granting to residents free lands within reasonable distance of a railway, and also to advance, at a low rate of interest, on reasonable security, sufficient money to enable families to take up said lands and exist upon them for one year; requesting the Government to pass a Sunday observance law, compelling all employers of labor to close their factories and workshops during the twenty-four hours constituting the Sabbath, excepting in cases of absolutely needed repairs; that whereas clause six of the Anti-Combines Act provides that "the foregoing provisions of this Act shall be construed as if section twenty-two of the Trades' Union Act had not been enacted"; and whereas it is under said section twenty-two that trade unions are exempt from prosecution for being in restraint of trade, therefore be it resolved that this Congress instruct its Executive Committee to use their utmost endeavors to have said clause six of the Anti-Combines Act repealed at the ensuing session of the Dominion Parliament; and, that this Congress is of the opinion that the people of Canada are capable of finding a man among themselves to perform the functions of Governor-General of Canada, therefore be it resolved that we demand, on behalf of the people of this country, the privilege of hereafter electing our own Governor-General, instead of allowing the British Government to appoint him.

* NOTE.—An Ontario Statute, 1892, intituled "An Act for the protection of Persons employed in places of Business other than Factories," goes a long way in the direction indicated as a cure for the evil complained of in the above resolution.

SEVENTH MEETING, QUEBEC, QUE.

1891.—The seventh annual session of the Trades and Labor Congress of the Dominion of Canada was held in the city of Quebec in September, 1891. At the formal opening of the Congress fifty-six delegates, including one lady—Mrs. Mary Duffey, of Montreal—responded to their names on roll call. Before proceeding to its regular business the Congress was honored by an address of welcome to the "ancient capital" by Mr. Mayor Fremont, M.P. This address emphasized more than one subject worthy of thought, and is as follows:

Mr. CHAIRMAN, LADIES AND GENTLEMEN,—When I was asked by the members of the Quebec and Levis Trades and Labor Council to take a part, which is very small indeed, in your Congress, I must say that I was most happy to accept, and that I am very glad to be in your midst to-day. I have been happy to leave my Parliamentary duties for a few days, and I have now a very agreeable task in telling you how welcome you are in the city of Quebec. Our doors as well as our hearts are open to the friends of labor. While I was coming up to the city hall to meet you, and to be present at the opening of the Congress, I was thinking that this is not a mere demonstration, it is not simply a feast in which all laboring classes are invited to attend. It seems to me that there are three distinct features in the proceedings of your Congress. The demonstration, the procession and the other festivities which accompany the Congress, are as many occasions to show all the laboring classes the importance there is for all to join your unions. Those whom you have invited to join, magistrates, capitalists or others, prove that your object is not to rally against authority or capital, but, on the contrary, that you are ready to work hand in hand for the common prosperity of all classes, and of the country at large. The Congress itself is the practical part of the celebration, and it is during the sittings of the Congress that you will study the reforms necessary to improve the condition of labor without unduly oppressing capital or any other class. May the Almighty, without whose help our endeavors are useless, send you His wisdom in your debates and enlighten your minds, and I doubt not that this Congress will be beneficial to the laboring classes and also to the Dominion at large.

Shortly after beginning regular business the Congress was honored by a visit and a complimentary address on the part of the Premier of the Province of Quebec, Hon. H. Mercier, who was accompanied by several members of his Cabinet. In concluding, the honorable gentleman placed at the disposal of the Congress the free use of the Legislative Chamber and the assistance of the officers of the House, and as a consequence the remainder of the business of the Congress was transacted in that chamber.

The Executive Committee, representing the Congress between sessions, presented the following report of work since the last annual meeting as regards legislation sought or secured of a federal character, and was adopted, viz.:

Your committee held a preliminary meeting in the city of Ottawa, on September 6th, 1890, and after organization, Mr. J. T. Carey of St. Catharines, was appointed to act as the representative of the Congress during the next session of Parliament.

Your committee waited on the Right Hon. Sir John A. Macdonald and the members of his Government on Monday, May 18th, when the various subjects of interest to our organization were laid before them. Your committee received an attentive hearing and were promised that the matters would receive the careful attention of the Government in due time. But owing to the death of Sir John A. Macdonald, and the consequent reorganization of the Cabinet, very few of the subjects received the attention your committee believe they otherwise would. The only bills introduced this session of interest to wage-workers were "Bill No. 15, an Act to amend the Act for the Prevention and Suppression of Combinations formed in Restraint of Trade," and "Bill No. 149, an Act Respecting the Inspection of Ships." While the latter Act is one in the interest of sailors and is all that could be desired in that line, it does not meet the requirements of your committee, and is not what was asked for by the last Congress and petitioned for by your committee. The legislation wanted was an "Act for the Inspection of Gear and Tackle used in the Loading and Unloading of Vessels," so as to prevent, if possible, the many accidents that happen on the docks of the various parts of the Dominion through the use

of defective gearing. The attention of the Minister of Marine and Fisheries being again called to the matter by your committee, the following new section was added to the Bill: "Every inspector may at any time visit any ship, whether registered in Canada or elsewhere, and whether propelled wholly or in part by steam, and inspect and examine the tackle, machinery or apparatus used for the loading or unloading thereof, and if he considers such tackle, machinery or apparatus defective so as to be dangerous to life, he shall report thereon to the Minister, who may order that such tackle, machinery or apparatus shall not be used until permitted by the Minister, and any tackle, machinery or apparatus used in violation of such order shall be liable to forfeiture and seizure by the chief officer of customs at any port, and may thereupon be sold in the same way and under like provisions as goods liable to forfeiture for non-payment of customs duties, and the owner of the ship shall incur a penalty of $100, and such ship shall be liable for the same." Bill No. 15* was amended by the Senate by adding "provided always, that nothing in the said Act shall apply to business arrangements or transactions which are not to the detriment of public interests." An Act was also introduced and passed by the Government entitled "Bill No. 106, an Act to provide for the Marking of Load Lines." The Bill is of little practical use to those in whose interests the Congress is working, as its operation does not extend to the inland waters of Canada.

Previous to the meeting of Parliament blank forms of petitions were forwarded to all organizations in the Dominion for signature, and your committee are pleased to state that a very large number were presented to the House of Commons. The subjects petitioned for were:

"An Amendment to the Act for the Prevention and Suppression of Combines.

"An Act for the Inspection of Gear and Tackle used in the Loading and Unloading of Vessels.

"An Amendment to the Seamen's Agreement Act, giving the right to Trial by Jury before Conviction for any Offence.

"An Act making it a Criminal Offence to establish Private Detective Agencies in the Dominion.

"An Act for the granting of Free Lands to Residents of the Dominion within a Reasonable Distance of a Railway.

"For the Discontinuance of the Government's present System of Immigration.

"For the Total Prohibition of Chinese Immigration."

Memorials respecting all matters referred to your committee by the Congress were prepared and forwarded to His Excellency the Governor-General and the members of the Government.

The Legislative Committee for the Province of Quebec presented the following report, which was concurred in:

Among the different resolutions adopted at the last session of the Congress, held at Ottawa, we deemed it advisable to select the following for presentation to the Government, and petitioned for the same through the Provincial Legislature:

1st. That boys under sixteen years of age and girls under eighteen be prevented from working in tobacco factories.

2nd. To amend the Provincial Electorial Act so that the right to vote be ceded to any man over the age of twenty-one years, and earning $300 per annum.

3rd. That a half holiday be declared on voting day.

4th. Asking for gratuitous and compulsory education.

5th. An Act calling for the appointment of scaffold inspectors.

6th. An Act granting to tradesmen and laborers a first mortgage on the product of their labor to the full amount of their wages.

About three hundred and sixty petitions, coming from sixty labor organizations in this province, were submitted to the Legislature, severally praying for the adoption of the above reforms.

*This Bill did not become law as the reference thereto in this report would lead to believe. It passed the House of Commons, it is true, but the Senate, on a report of a committee of that body, threw the whole measure out.

We likewise submitted the following requests to the Provincial Government: 1. Abolish turnpike trusts. 2. To no longer grant subsidies or annuities to those institutions that compete in public trade. 3. To establish boards of arbitration to settle the difficulties that arise from time to time between employers and employees. 4. To prevent Civil Service employees from entering into competition with outside labor. 5. The establishment of a Provincial Printing Bureau, wherein might be printed all Government work, as well as the books used in the public schools, said books to be distributed to the pupils. 6. The abolition of the contract system on all public works. 7. To grant a subsidy to any laborer of the province desirous of taking up Government land for cultivation. 8. To establish reformatory schools in country places where agriculture might be taught to those detained there 9. The School of Arts and Designs to appoint a professor of carriage designs, for the benefit of those employed in the coach and carriage industry. 10. To adopt the eight hour system on all Government works. 11. That all Government printing be given to firms employing union printers.

Of all the measures asked for, only one was passed, it being the one concerning employees in tobacco factories. The Factory Act was amended by the insertion of a clause prohibiting the employment of boys under fourteen and girls under sixteen in any factory in the province. The same Act was likewise amended as follows: In any of the unhealthy trades contained in the schedule, as approved by the Lieutenant Governor in Council, no boy under sixteen or girl under eighteen shall be allowed to work.

It is quite probable that the shortness of the session prevented more attention being paid to the reforms asked for by organized labor.

We have every reason to believe that the work of the Congress has not been futile, and that in the near future much more attention will be accorded to the questions affecting labor interests in this province.

Before closing this report we would mention that a determined attack was made upon the Quebec Ship Laborers' Benevolent Society by the Quebec Board of Trade, which sought to deprive the society of its charter. It affords us much pleasure to state that the attempt was frustrated, and we would likewise desire to sincerely thank the labor organizations of this province for their sympathy and support, and more especially for their zeal and promptitude in handling the various petitions.

The report of the Legislative Committee for Ontario followed, and was adopted. It read as follows:

The sub-committee of your Executive Committee, appointed to watch legislation in the Province of Ontario, beg to report that they had an interview with the members of the Ontario Cabinet, and received at their hands every courtesy. The matters dealt with at the last Congress pertaining to Ontario were laid before the gentlemen named, and were discussed at length by them with your committee, they evincing every desire to go with the Congress in the several matters as far as they in their judgment deem public opinion prepared for it. They promised legislation in the matter of amending the Mechanics' Lien Act so as to extend its provisions to lumbermen, also amendments to the Education Act on the lines indicated in the resolutions passed at your last Congress. Your sub-committee are pleased to say the promises of the hon. gentlemen have been fulfilled, and Ontario has now as liberal and radical enactments pertaining to education as exists, we believe, anywhere in the world. In all fairness we have to accede to the Toronto Trades and Labor Council a large share of the credit in obtaining this legislation —this everwatchful body being ready at all times to advance the interest of wage-workers.

Your sub-committee are also pleased to be able to say that legislation inimical to the interests of the masses, and in favor of the classes, has been successfully thwarted for the time being, thanks to the Trades and Labor Council and District Assembly of the Knights of Labor, both of Toronto, whose representatives were successful in their opposition to the several class measures before the Private Bills Committee of the Ontario Legislature. On the whole we think organized labor may fairly congratulate itself on the legislation in the Province of Ontario for 1891.

Your sub-committee feel it their duty to bear testimony to the unvarying courtesy of the Attorney-General, Hon. O. Mowat, and his colleagues. Every consideration and attention was given the views on the several matters laid before them, and they evinced

a desire to do justice to the masses, and expressed the wish that we should at all times wait upon them upon any matter that was calculated to improve the condition of the working classes.

In conclusion, your sub-committee would impress upon your body the necessity of continued persistency in agitation for needed legislation. It is only by this eternal vigilance, which is the price of all liberty and justice, that we can expect to obtain what we are seeking.

Petitions were presented praying that power be given municipal councils to pass by-laws regulating the erection and construction of scaffolds, that the entire electorate be entitled to vote on money by-laws, that land held for speculative purposes be taxed to its full value, and that persons in charge of stationary engines be compelled to undergo an examination.

Outside of and beyond the matters referred to in the reports preceding, the work of the Trades and Labor Congress of 1891 is fairly indicated in the principal resolutions passed during its four days' session, and they were:

That the Congress petition the Provincial Legislatures to abolish property qualifications for holding municipal office.

Whereas, the recent investigations undertaken by committees of the Senate and House of Commons have demonstrated that the system of constructing public works by contract is the cause of flagrant and deplorable corruption, resulting in enormously increasing the cost of such works to the country; therefore be it resolved, that in the opinion of this Congress the system should be abandoned, and in future all public works should be built by day labor.

That all railway and telegraph lines should be owned and controlled by the Federal Government; and that all gas and electric light plants, telephones, ferry, waterworks, and street railway lines should be owned by the municipality in which they are situated.

Whereas, the shortness of time within which information can be laid of offences under the Ontario Factories' Act operates to defeat the law; therefore be it resolved, that in the opinion of this Congress the time for laying information under the Act, and the time within which punishment is to be inflicted under section 38 of the Act, should be extended to six and nine months respectively.

Whereas, it is desirable that there should be enacted and enforced a Dominion Work shops' Regulation Act, applicable alike to all the provinces, so that the employers of one section may be at no disadvantage as compared with the employers of another, and that such Act should provide for workshops similar regulations to those sought for factories, with the necessary male and female inspectors for its enforcement; therefore be it resolved, that this Congress request of the Dominion Parliament the passage and enforcement of a Workshops' Regulation Act; and be it further resolved, that pending such action by the Dominion Parliament, or the determination of the question of jurisdiction, this Congress request of the several Provincial Legislatures the passage and enforcement of such Acts in each of the provinces.

That in the opinion of this Congress the interests of the female workers require that female inspectors of factories and workshops should be appointed by the Government, and that in order that the duties of such female inspectors, when appointed, shall not be performed in a merely perfunctory manner, the wishes of the various labor bodies should be consulted in making such appointments.

That the Government be petitioned to repeal the clause in the Seamen's Agreement Act not allowing any appeal after a conviction for any offence, and to grant instead the right of appeal in such cases.

That this Congress requests of the Dominion Government the passage of such legislation as will have the effect of prohibiting the importation into Canada of Chinese labor and of preventing the further admission, under any circumstances, of any of this undesirable class of immigrants.

Resolved, that while the organized workingmen of Canada are equally desirous with any other class in the community of seeing the unsettled portions of the country settled and improved, and are willing to support and approve any reasonable and judicious expenditure, other than financial assistance to immigrants, by the Dominion and Provin-

cial Governments for this purpose, yet they are strongly opposed to the expenditure of any money, directly or indirectly, for the purpose of bringing to Canada artisans and agricultural and unskilled laborers, whether adult or juvenile, to compete in our already overcrowded labor market;

Resolved further: the organized workingmen of Canada recognize as an unmitigated evil the practice of steamship companies and their agents making highly colored and misleading statements for the purpose of decoying immigrants to Canada, and that whenever a steamship company, either directly or by an agent, makes any statement or offers any inducement to bring artisans or laborers to Canada, the Dominion Government should at once withdraw any subsidy it may be paying to such steamship company.

That the Legislature of the Province of Quebec be petitioned to amend the Municipal Act so as to provide for a ballot vote at municipal elections, the same in Parliamentary elections.

Resolved, that the Provincial Legislatures be requested to amend the laws governing incorporation so as to facilitate the incorporation of trades' unions and labor societies, whether of a protective, benevolent or beneficiary nature, believing that these bodies are equally entitled to legal recognition with any other body. We simply assert the right of equality before the law, and the payment of high fees being beyond our ability, we assert that our poverty should not be allowed to remain as the only reason why we should be bebarred from our just rights

Whereas, the volume of the circulating medium is altogether too small to do the business of the country without resort to an undesirable and oppressive, if not ruinous, extension of the credit system; and whereas, the construction of needed public works and the carrying on of desirable public improvements by the Government and by municipalities, and borrowing money to pay the cost thereof, creates an intolerable interest burden; and whereas such public works and improvements, when finished, will be an addition to the fixed wealth of the country, and therefore a proper and desirable basis for money; therefore resolved that the Dominion Government should issue full legal tender paper money, redeemable in from thirty to fifty years, in sufficient quantity to meet the cost of constructing necessary public works and making needed public improvements, and loan such money to municipalities at a rate of interest sufficient only to cover the cost of issue and management, for the construction and carrying out of such works and improvements, requiring said municipalties to levy rates sufficient to pay the interest on such loans and to form a sinking fund for their repayment within the time at which the money is made redeemable.

That the Government of the Province of Quebec be requested to pass an Act fixing at nine hours the working day for women employed in workshops, shops and factories.

That the Provincial Government be petitioned to establish printing and binding bureaus for the purposes of all Governmental printing and the production of all public school books, to the end that books may be produced at the lowest possible cost, and supplied to pupils free of charge, and that the superintendents of such bureaus be independent of all political influences, and free to conduct the same on strictly business and union principles.

That whenever tenders are called for by either Federal or Provincial Governments, or by any municipal council for the building of any public work or the performance of any public service, and where, in the building of such work or the performance of such service workmen will be employed belonging to a trade or calling in which there is a usual and commonly recognized scale of wages, the specifications shall contain a clause that the successful tenderer shall pay the rate of wages prevailing in such trade or calling in the municipality in which the work is to be performed, or forfeit his contract.

That this Congress recommends the Federal and Provincial Governments, and also municipalities in the Dominion, to give their printing contracts to offices where the typographical unions are recognized, in preference to non-union offices.

That this Congress hereby requests that the Dominion Government do, as soon as possible, make it a criminal offence to establish or retain private detective agencies in this country.

Whereas, reformatory schools, by undertaking different industries, injure private enterprise; therefore be it resolved, that we request of the Government the establishment of such schools only in the country, so that agriculture may be taught to those detained in them, instead of industries.

Whereas the masses are interested in and bear their portion of the expenditure of all municipal moneys; therefore, be it resolved, that it be an instruction from this Dominion Trades and Labor Congress to its Executive Committee to petition the Legislature of the Province of Ontario to so alter or amend the Municipal Act as to allow the entire electorate of all municipalities to vote on all money by-laws.

That the Government of the Province of Ontario be requested to further amend the law relating to landlord and tenant, so as to render null and void any agreement intended to prevent or evade the carrying out of the provisions of the law as it now stands.

That we request the Dominion Government to consider the advisability of increasing the rural population of this country by granting to residents free lands within a reasonable distance of a railway, and also to advance, at a low rate of interest, on reasonable security, sufficient moneys to enable families to take up said lands and exist upon them for one year.

That this Congress petition the Ontario Legislature to so amend chap. 225, cited as "The Public School Act" (1) That all children attending school, whether Public or Separate, be provided with books free of charge. (2) That the Constitution of School Boards for cities, towns and incorporated villages be modeled after the system now in vogue in English boroughs, embracing the following features: Election of trustees from the whole municipality at large by cumulative voting, thereby doing away with the ward system and securing a proper minority representation. (3) That it be compulsory on School Boards to provide the necessary accommodation for all children. (4) That all elections for school trustees shall be by ballot, and that the elections take place on the same day as the municipal elections.

Whereas, a great number of institutions subsidized by the Government of the Province of Quebec are making great competition in the printing trade and other industries; therefore be it resolved, that this Congress request the Legislature of Quebec to give no subsidies to institutions making competition in such industries.

Whereas, it is necessary for the moral and physical elevation of the people that the hours of labor should be shortened; and whereas, owing to the monopolization of inventions and discoveries, and of natural opportunities, the power of man to produce wealth has not operated to relieve labor by reducing its daily hours of toil; and whereas, individual employers claim, with some show of reason, that to be fair any reduction of the hours of labor should be general and gradual; therefore be it resolved, that in the opinion of this Congress the Dominion Parliament should enact a law which would provide for the gradual reduction of the hours of labor, so that within three years the legal work day should consist of eight hours, excepting only such callings as in which an arbitrary fixing of the hours of labor is impracticable.

That the Legislative sub Committee of the Province of Ontario be and they are hereby instructed to urge energetically upon that Government the absolute necessity of making the following changes in the Education Department thereof: 1st, That the present Legislative grant to Public, Separate and High Schools be increased and that the Municipal grant be always at least equal to the Legislative grant; 2nd, That all municipalities other than cities, towns and villages, be equally divided (territorially) as nearly as possible into school sections, and that a uniform rate be levied for school purposes in said municipalities, and to be equally divided among the sections regardless of attendance, due regard to be had for schools employing two or more teachers.

That the Act entitled "The Mechanics' Lien Act of Ontario," should be so amended as to secure to mechanics and laborers, besides the rights provided for in said Act, a lien or first claim on any rent or other income derived from any building on which they have been employed, to secure payment of wages, and that interest on mortgages shall be considered as income for that purpose.

That in the opinion of this Congress a Dominion Board of Arbitration and Mediation should be constituted, whose duty it should be to arbitrate differences between employers and employees, with a view to preventing, as far as possible, strikes and lockouts, and that in the case of railway companies and other corporations holding public franchises the decisions of this Board should be compulsory.

That this Congress petition the Provincial Governments to give power to municipal councils to pass laws regulating the erection and construction of scaffolds in the construction of buildings, and that efficient inspectors be appointed to see that such are enforced.

That Section 1 of Article 3026, of the Revised Statutes of Quebec, be amended as follows: That boys under 16 years and girls under 18 years be prohibited from working in match, tobacco and cigar manufactories.

That municipalities are naturally better able than Provincial Legislatures to judge as to how taxation for municipal purposes may be most equitably levied, and therefore it should be left to each municipality to decide upon the incidence of taxation.

That this Congress demands at the hands of the Dominion Parliament the passage of an efficient law, under suitable penalties, to prevent the importation of workmen into Canada under contract.

Whereas, for the avowed purpose of giving protection to Canadian labor the Parliament of Canada has adopted a policy of protective tariffs; and whereas, only by organization can workingmen secure any of the benefits in the way of increased wages which they were promised as a result of protection; therefore be it resolved, that whenever the employers in any line attempt to destroy or prevent the organization of their employees it is the duty of organized labor to use its power, politically, to have the kind of goods manufactured by such employers placed on the free list.

That the Legislative Committees for the Provinces of Ontario and Quebec be and they are instructed to urge upon the Provincial Governments the following amendments to the municipal laws of the said provinces: The adoption of manhood suffrage for municipal elections for the Province of Quebec; That a legal half holiday be put on the statute book for both municipal, provincial and federal government elections, and that voting be made compulsory.

That in the opinion of this Congress, the right to exercise the franchise on the same qualification as that under which men may vote, should be extended to women; and that it be an instruction to the Executive Committee of this Congress to urge the matter upon the Federal and Provincial Governments.

That this Congress petition the Quebec Legislature to so amend the Municipal Act, that the power to regulate between masters and servants be no longer allowed to remain in the hands of municipalities, but it shall be governed by a just and equitable Provincial Act.

That the municipal corporations of cities be petitioned to place a tax on vacant lots held for speculative purposes to their full value.

As the question of cheap Chinese labor and Chinese immigration is one that is each year becoming more prominent, it is considered advisable to include the following communication in relation thereto, sent to the Congress from the Trades and Labor Council, of Vancouver, B.C., and which, after being read, was, on motion, ordered to be spread on the minutes, viz.:

VANCOUVER, B. C, August 19th, 1891.

Mr. G. W. Dower, Secretary-Treasurer, Dominion Trades and Labor Congress, Quebec:

DEAR SIR AND BROTHER,—A special meeting of the Vancouver Trades and Labor Council, held on the 18th instant, decided not to send a delegate to the Dominion Trades and Labor Congress at Quebec this year, and also unanimously expressed the desire that the outcome of your deliberations will equal all that you anticipate.

Last year at Ottawa was the first time that British Columbia was voiced in your Congress. Then, as at present, it was believed the notice to the all-absorbing Chinese question should be acted upon by your body; so we again desire your aid in this matter. The continual arrival of those undesirable immigrants is but the thin edge of the

wedge to the ultimate degradation and ruin of the dignity of white labor on the Pacific coast of our fair Dominion. Chinese immigration in such vast numbers to this province is due mainly to the strict exclusion laws of the United States. British Columbia capitalists, too, freely encourage this kind of immigration. The immorality of this class of people should not be slighted. It never will be possible to elevate the Mongolians as a race to the level of the Caucasians. Many young white persons lay the blame of their ruin directly to the Chinese, who taught them, besides other vices, the awful habit of using opium. Details of this filthy and abominable habit would be classed as obscene. It is the bounden duty of our Government to enact laws that will enforce a curtailment of both the importation and manufacture of opium to and in Canada, and also limit its sale to a minimum. To look upon an opium fiend is now no longer a surprise or a horror, but is becoming an everyday event. We would strongly urge the Government of this country to legislate as did Australia a few years ago, namely, to exclude the Chinese altogether. In this connection it would perhaps be well to mention that a circular from the Council has been forwarded both to the Dominion Government and the Imperial authorities on the subject of the limitation of Chinese immigration within its lawful bounds. As no reply to the circular has yet been received from the State department, it would perhaps be better that a mere mention only be made of it.

However, a copy of the circular to which I have made reference will be forwarded to your address in due time, which will be as soon as I have an acknowledgement of its receipt from Ottawa. I might state in regard to the above, that with three trips of the new Canadian Pacific boats about six hundred and fifty more Chinese landed in the port of Vancouver than the law allows, according to tonnage. Thus, you see, the western part of the Dominion is being flooded with a class of immigrants that is slowly but surely sucking the life-blood out of our laboring white population. I might also mention in this connection that the Canadian Pacific Company either is at present trying, or will endeavor, to secure concessions from the Government that will enable it to transport a larger number of Chinese than is permitted by the law at present in force. The Act allows only one Chinese passenger for every fifty tons burden ; but rumors have been rife for a long time that the company will do its utmost to have the number of Chinamen increased according to tonnage. It is the wish of this Council that your Congress will do all in its power to checkmate, if possible, any steps in this direction.

During the last session of our Provincial Legislature the independent members worked hard to prohibit the employment of Chinese on all public works, and their exclusion, as far as possible, from the province. Their exertions were a partial success, and among other things they accomplished the passage of a memorial by the Assembly to petition the Dominion Government to increase the poll-tax to one hundred dollars. It still remains at fifty dollars, and whether or not the memorial was ever sent is not known.

Some months ago one or two cases of what was supposed to be leprosy was discovered among the Chinese at Victoria. Medical assistance was called in, with the result that two of the persons afflicted were pronounced lepers. A report of the investigation that was held was forwarded to Ottawa. Shortly thereafter a medical expert arrived in Victoria with the intention of making a full inquiry on behalf of the Government into the cases referred to. This gentleman, after having made a very close and careful examination of all the facts bearing upon the suspected lepers, reported to Ottawa that one was an undoubted and indisputable case of leprosy, but that the other, being in an incipient stage, he could not give a decided opinion, but said that everything pointed in that direction. This is the worst horror of all that comes from China, and it cannot be denied that the white population is liable to be afflicted with it at any moment. At present, there are some five or six lepers quarantined on an island near Victoria. Could not your honorable body urge the federal authorities to look into this matter and have this lazaretto removed to a greater distance from civilization.

We are grateful for the efforts of the deputation sent by your Congress to interview the Government, both this and last year. It is plain that the Chinese will never become citizens, and would make poor soldiers ; and as you are doubtless well aware, enter into unfair competition with white and Christian labor. The Government ought to protect

the interests of the loyal citizens—the workingmen—in preference to those of the "heathen Chinee." The fifty dollar poll-tax has not the effect of keeping out the Chinese immigrants, or even of checking the number of Mongolians who flock this way. Canadian contractors, under cover, can and do pay the necessary sum to the Government to allow them to land, and then make the Chinamen work until the advanced poll-tax is paid back to the unscrupulous contractors; and the Chinese often pay a big percentage for the favor.

Chinese in mines is another phase of this vexed question. Their presence there is in many cases prejudicial to life, and is frequently the cause of explosions and their resultant effects. This we know from experience in the Wellington collieries. This subject might fill books enough for a good-sized library; therefore exclude the Chinese before it is too late.

As far back as last March a circular was issued by the Council to various labor organizations in the eastern part of Canada, calling attention to the over-stocked state of the labor market, and dwelling particularly on the fact that certain newspapers, both in the east and in the west, were at great pains, whenever the humor seized them, to dilate at length on the present prosperity and future prospects of this province of ours. These screeds usually took care to state that "there was work for everybody," and that "no man need be idle who wanted to work." This blarney and balderdash, I need not say, was all in the imagination of the writers, and had no foundation in fact. The circular issued by us was published, I believe, in the *Carpenter*, the official journal of the United Brotherhood of Carpenters and Joiners.

A word at this juncture with regard to mechanics who do not belong to labor organizations will not be inopportune. This province is well organized; but still we experience a good deal of trouble occasionally from men who come here from the east, who immediately look around for work without bothering their brains as to whether or no there is such a thing as a union in existence. The unions here, I am glad to say, have been very successful this summer in swelling their ranks very materially from this source. Still I must confess that something more might and ought to be done in the east with respect to the work of organization than is at present the case. There are numbers of good-sized towns, both in Ontario and Quebec, not to mention the Maritime Provinces, in which a union is almost unknown except by name. Now, this is not quite fair either to the union or non-union mechanics. Some steps, we think, ought to be taken in this direction, and some means devised whereby our fellow-craftsmen who know not the benefits of unionism may have some of our beliefs inculcated into them.

One other thing to which I would desire to draw your attention is the great necessity there is in this country for ranchers, that is, people who have a thorough, practical knowledge of stock-breeding, grain-raising or fruit-growing. All these are in the line of the rancher in British Columbia, either separately or collectively; and as the climate is so admirably adapted to anything that can be attempted in the lines mentioned, there is the best opening that could be desired for this class of immigration. We would respectfully ask your honorable body to bring the matter before the notice of the Government, and urge the furtherance of any measures that will tend to direct immigration of that nature this way.

The Vancouver Trades and Labor Council, and the majority of the people of this province, recognize that the recorded proceedings of organized labor are now of vast importance, and the time is not far distant when the demands of the great labor bodies will be almost irresistible. The Dominion Trades and Labor Congress will soon possess a weight in public affairs equal to our parliaments and legislatures. A workman's vote counts just as much as a capitalist's, and as the most influential body usually guides the greatest number of men, there is already an enormous vote behind your Congress, and that vote is being inspired. The greater the power, the greater the responsibility that attaches to the leaders of our labor organizations; and those leaders who recognize this fact in the greatest degree will, with a due amount of caution and prudence, succeed in accomplishing the greatest good for the elevation and improvement of the working masses.

We close by hoping that these gentlemen who are assembled in the seventh annual session of the Dominion Trades and Labor Congress, at Quebec, will pass a resolution to the effect that the next place of meeting will be at Vancouver, B.C., to which place we extend a cordial and fraternal invitation.

With greetings to all the brethren assembled.

Believe me to remain,

Yours fraternally,

J. A. FULTON,

Sec'y Vancouver Trades and Labor Council.

EIGHTH MEETING, TORONTO, ONT.

1892.—This year the Trades and Labor Congress of Canada was called to order at 11 a.m. on the 8th of September, in the City Council Chamber, in the city of Toronto. President T. W. Banton, of Toronto Trades and Labor Council, when calling the meeting formally to order, said that the Congress had been called the Workingmen's Parliament, and he expressed the hope that the day was not far distant when labor would have direct representation in both Houses of Parliament. The famous cap of Keir Hardie in the British House had led to remarks about representatives of labor being boorish, insolent, and not fit for high places. Those who threw stones of that kind should remember that boorishness and insolence were not found exclusively among workingmen, but extended to the so-called cultivated classes. The Congress was not at all revolutionary in its action. True, some resolutions when first brought up sounded wild and visionary, but they appeared less so the second time, and after a few years men wondered why they had not been adopted before. He further said that in all the work of the Congress there was nothing impracticable or unreasonable, and concluded by introducing the Chief Magistrate of the city.

His Worship Mayor Fleming, in well-chosen though brief words, welcomed the delegates to the city. He assured them that he had extended no more hearty welcome to any convention than that to the Labor Congress. He admitted frankly that the position he occupied was owing largely to the workingmen of Toronto. The seconder of his nomination was a prominent member of the Trades Council, an almost unprecedented thing. He expressed pleasure that in Toronto there was an entire absence of the bitterness of feeling between capital and labor that prevailed in many other cities, and spoke a word of praise of the work of the Trades Council in closely watching municipal affairs. As one who had worked as hard for a living as any delegate to the Congress, he expressed the utmost sympathy with the just demands of labor.

A few words of welcome were also addressed to the delegates by Aldermen Hallam, Saunders, Shaw, Lamb, Orr, Wm. Carlyle, Crawford, Atkinson, Bell and Jolliffe, and Mr. Joseph Tait, M.P.P., Rev. Father Rooney and Rev. Stuart Atcheson.

Mr. Banton then introduced Mr. Urbain Lafontaine, President of the Congress, who spoke as follows:

Mr. Mayor and the Aldermen of the City of Toronto:

GENTLEMEN,—The sympathy so generously offered to the labor class of the Dominion calls for the most sincere thanks on our part. Coming from such a source, it will largely contribute to harmonize capital and labor, and will widen the gate for an amicable solution of this difficult problem.

The result of our deliberations in Congress will prove our desire to settle the labor question by constitutional means.

We propose to have public opinion on our side by making nothing but fair and equitable demands to our legislators.

Your Worship, permit me to offer my most cordial gratitude to the citizens of Toronto for their unbounded hospitality.

President Lafontaine then announced that owing to the courtesy of Hon. Sir Oliver Mowat, Premier of Ontario, in conceding the privilege, the regular sessions of the Congress would be held in the Legislative Chamber in the Parliament buildings, commencing at 3 p.m.

When the President took the chair in the afternoon, the Credential Committee reported 77 credentials of delegates entitled to seats. Of these, 13 were from the city of Montreal, and 13 from the city of Quebec, in the Province of Quebec; Hamilton sent 5, Ottawa 2, St. Catharines 4, Guelph 1, and Toronto had a quota of 39—all of Ontario.

The Secretary-Treasurer's annual report for the previous year (which evidenced great economy in administration and general expenditure) showed the gross receipts to have been $452.02, and the total expenditure $397.18, leaving a net balance of $54.84.

Report of Executive Committee.

Your committee met on September 4th, 1891, in the city of Quebec, when the work for the year was laid out. It was decided that a deputation, to consist of not more than four members, be selected to wait on the Government at Ottawa during the session, the same to be the President, the Secretary, and the Chairmen of the Provincial Parliamentary Committee, Messrs. Routier and March.

The important subject of the payment of current rate of wages on Government works was referred to Messrs. Wright and Lavigne, who submitted the following report:

Mr. Geo. W. Dower, Secretary Executive Committee Dominion Congress:

Dear Sir,—In accordance with instructions we laid the resolution passed at the late meeting of the Congress *re* letting of contracts where rates of wages are fixed, before the Hon. the Minister of Public Works. We also, accompanied by a deputation of members of Parliament, had an interview with the Minister this afternoon. The members comprising the deputation were Messrs. Cockburn, Denison and Coatsworth, of Toronto; Mr. N. C. Wallace, of West York; Mr. Ingram, of Elgin, and Mr. Lepine, of Montreal. After stating our case to the Minister, in which we were warmly seconded by the members accompanying us, Hon. Mr. Smith stated that he could not see his way to recommending the Government to adopt the suggestion. His objection was on the ground that in his opinion the Government ought not to be asked to interfere as between employers and employees in matters of wages. We endeavored to point out that if no condition such as we asked were imposed upon contractors, then those outside contractors who had not entered into an agreement to pay the present union wages would be given an advantage over the union contractors in Toronto, but our argument failed to change his opinion. He assured us that not only because of his personal desires, but also because of the oft-times urged wishes of the members for the city and the member for West York, he would like to further the wishes of the workingmen of Toronto when these did not conflict with what he conceived to be his duty as a Minister of the Crown.

We fear that there is little hope at present of succeeding in this direction. Possibly there may be changes in the Cabinet in the near future which may make it easier to have the principle of our resolution adopted.

Very truly yours,

A. W. Wright,

Ottawa, September 9th, 1891. A. Lavigne.

The following report is presented by the Legislative Committee of the Province of Quebec:

Your Legislative Committee for the Province of Quebec beg to submit the following as the report of their transactions since the meeting of the Congress in the ancient capital of Canada, in September last. Our hopes for considerable labor legislation at the session of the Provincial Parliament just closed, at the hands of the late Mercier Government, who appeared very favorable to our cause, were blighted by means over which we had little to say, namely, a change of government, and the consequence was that owing to the excitement in political circles, with a new master-hand at the helm of the ship of state, practically nothing was done on behalf of the people we represent. The Government were too much occupied with other affairs to devote sufficient time to our interests, and, while several important Bills were introduced by private members, among others to prevent the seizure of workingmen's wages; early closing of stores in cities and towns; protection of lumbermen's wages; appointment of inspectors of gear and tackle at the Ports

of Quebec and Montreal; employer's liability Act, etc., they all died in their infancy or were choked off in one way or another; consequently not one single Act of legislation bearing on labor was enacted. Messrs. Routier and Gale, who were accompanied by Mr. P. J. Jobin, had an interview by appointment with the Premier, Hon. C. B. DeBoucherville, and Hon. Mr. Pelletier, the first days of the session, and were courteously received by the Ministers. The committee presented a long list of the most important resolutions adopted at the last meeting of the Congress, which were selected by the full board as having special reference to this Province. The committee discussed at length many of the measures, and the Ministers, while very anxious to secure all information, also appeared satisfied with the majority of them, and promised to give the various questions submitted their earnest attention during the recess. They held out no hope for any definite action being taken at once, owing to the serious work of the session, which subsequently proved to be the case. The request of the Montrealers for a workingmen's library was not entertained by the Premier; and the library formerly existing here has been closed on account of the withdrawal of the usual Government grant. Another question worthy of note and the necessity of having representatives of our body at the different legislative seats was in relation to amendments sought by the Real Estate Association of Montreal to the civic bill of that city, one of which particularly had for effect the disfranchisement of workingmen in municipal affairs. Your committee interviewed many of the members of the House and were in a degree at least the means of preventing any radical change in the civic government by the masses from taking effect.

With best wishes for the future usefulnes of the Congress as a channel for labor legislation, and the hope that better results will accrue in the near future, the whole is respectfully submitted.

George Gale,
Luc Routier,
L. Z. Boudreau.

The following report is presented by the Legislative Committee of the Province of Ontario:

Early in the past year petitions addressed to the Ontario Legislature were forwarded to that body by the various labor organizations, praying for the passage into law of Acts for the abolition of property qualification for municipal officers; for the construction of public works by day labor; for allowing the entire electorate to vote on money by-laws; for the payment of the prevailing rate of wages on Government works; and for municipalities to be allowed to decide upon the incidence of taxation. On February 20th, Messrs. March, Beales and Dower, accompanied by Mr. Hastings of the Hamilton Trades and Labor Council, waited on Members of the Government and laid before them the various subjects of interest to your body. The question of granting bonuses to manufacturing industries, referred to your Committee by the Hamilton Trades and Labor Council, was also dealt with at length. Your Committee was courteously received and the promise made that the various subjects would be given due consideration.

Of the many Acts of a public and general character passed into law at the last session of the Provincial Legislature, eight were of varying importance to organized labor and all who work for wages. These eight Acts are intituled as follows:

"The Mines Act, 1892."—This Act is an elaborate and carefully prepared law, and covers 24 pages of the Ontario Gazette. The interpretation clauses define the words "mine and mining," "mining division," "party wall," "shaft plan," "machinery," "owner," "agent," and "inspector," and "Bureau of Mines," and "power of its Director." Under a provision of this Act "No boy under fifteen years of age shall be employed, or allowed to be for the purpose of employment, in any mine to which this Act applies below ground; and no girl or woman shall be employed at mining work or allowed to be for the purpose of employment at mining work in or about any mine." "A boy or male young person of the age of fifteen and under the age of seventeen years shall not be employed in or allowed to be for the purpose of employment in any mine to which this

Act applies below ground for more than forty-eight hours in any one week, or more than eight hours in any one day, or otherwise than in accordance with the regulations following, that is to say :

" 1. That the period of such employment shall be deemed to begin at the time of leaving the surface and to end at the time of returning to the surface.

" 2. A week shall mean the period between midnight on Sunday night and midnight on the succeeding Saturday night."

The Act also provides for keeping a register of boys and male young persons employed ; as to employment of young persons in connection with engines ; and penalty for employment of persons contrary to the Act ; prohibiting the payment of wages at public houses, and for annual returns " of the number of persons ordinarily employed in or about such mine below ground and above ground respectively, and distinguishing the different classes and ages of the persons so employed whose hours of labor are regulated by this Act, the average rate of wages of each class and the total amount of wages paid during the year." It also provides that notices of all accidents in mines shall be sent to the Bureau of Mines. The general rules to be observed in every mine govern ventilation, gun-powder and blasting, man-holes in self-acting or engine planes, keeping of spaces clear, fencing of old shafts, fencing of entrance to shafts, securing of shafts, safety from water, division of shaft, signaling, cover overhead, chains, slipping of rope on drum, brake, inclination of ladders, dressing-room, fencing machinery, gauges to boilers and safety-valves, and it also declares contravention of rules to be an offence, and provides for punishment therefor.

" An Act to amend the Act respecting Wages," amends section 3 of the original Act so as to read as follows : " All persons in the employment of the execution debtor at at the time of the seizure by the sheriff or within one month prior thereto, who shall become entitled to share in the distribution of money levied out of the property of a debtor within the meaning of the said Act, shall be entitled to be paid out of such money the wages or salary due to them by the execution debtor, not exceeding three months' wages or salary, in priority to the claims of the other creditors of the execution debtor, and shall be entitled to share *pro rata* with such other creditors as to the residue, if any, of their claims." Like provisions are made in the case of an absconding debtor, as to priority of wages, etc.

" An Act to Consolidate the Acts respecting Compensation to Workmen in certain Cases." This Act construes the words " superintendence," " employer," " workman," " packing," and " railway servant." It also defines when a workman is to have a claim against an employer ; who is to be deemed an employer ; as to injuries by railways, and exceptions thereto ; as to limit of amount of compensation ; as to distribution of compensation ; limit of time for recovery of compensation ; no contract or agreement made or entered into by a workman shall be a bar or constitute any defence to an action for recovery under this Act of compensation for any injury, unless under certain limitations mentioned ; as to liability of personal representative ; money payable under penalty to be deducted from compensation ; as to form and service of notice of injury ; as to defence of want of notice ; as to particulars of demand ; as to consolidation of actions ; as to computation of time, forms and rules, and a saving clause as to actions in the past or pending at the time of the passing of the Act.

" An Act to amend the Free Libraries Act." This Act amends section 4 of the Free Libraries Act by adding thereto the following words, viz : " But no free library board shall in any year purchase any lands or erect any buildings or make any additions or alterations thereto exceeding in cost $2,000, without the authority of the municipal council." It also provides for the annual submission of estimates by the board to the municipal council, and also for the submission of by-laws for incurring debts for free libraries to the electors, and concludes with a section declaring that " No free library board shall establish or maintain a museum except by and with the consent of the council of the municipality, but this section shall only apply to cities having a population of 100,000 or over.

"An Act for the Protection of Persons Employed in Places of Business other than Factories." This Act does not apply to places of business covered by the provisions of "The Ontario Factories' Act and amendments thereto," but it does apply "to every place of business whether for the sale or manufacture of goods, or for any other kind of business in which women or girls are employed, and to all rooms and buildings used in connection with or for the purposes of the business." It provides as to sanitary arrangements in buildings; for penalty for violation of Act; for the appointment of inspectors by the municipality; and provides that all fines under the Act shall be paid to the treasurer of the municipality.

"The Assessment Act, 1892," amends the original Act by making sub section 23, of section 7 thereof, as to income tax exemptions, read as follows: "The annual income of any person, derived from his personal earnings, to the amount of $700." Provided, nevertheless, "that no person shall be exempted for or in respect of income for a sum greater than $700, whether derived from personal earnings or from other sources of income or from the two combined."

"An Act respecting Insurance Corporations." Sub-section 4, article 1, of this Act, defines "Society," or "Friendly Society," under its provisions, to be and include "any corporation, society, association, or fraternity, benevolent, mutual provident, industrial or co-operative, or the like," etc. Section 3, article 9, of the same Act recites that "Any lawfully incorporated Trades Union in Ontario which, under the authority of the Incorporation Act, has on insurance or benefit fund for the benefit of its own members exclusively, shall, upon due application for registry thereunder, be entitled to be registered on the friendly society register."

"An Act to amend the Act respecting the law of Landlord and Tenant." This measure is of a most unjustifiable and reactionary character. It was introduced at the near end of the session and although a prompt and vigorous protest was entered by the Toronto Trades and Labor Council and the Executive Board of D.A. 125, K. of L., against the Bill and the manner in which it was being hurried through without giving organized labor throughout the province a fair or even any opportunity of being heard in opposition thereto, the Bill was passed into law a few days after. The Bill only contained one section but that one section of five lines means a great hardship and injustice as a law. It reads as follows:

"1. Section 27, of the Act respecting the law of Landlord and Tenant is amended by adding to the end of sub-section 1 thereof, the following words: "Provided that in the case of a monthly tenancy such exemption shall only apply to two months arrears of rent."

In concluding, your committee, while appreciating the work of all the labor organizations of Canada, deem it a duty to pay a well deserved tribute of praise to Toronto Trades and Labor Council and District Assembly 125, K. of L., of the same city, for their vigilance, sound judgment and prompt action at all times when required in the interest of working people in any section of the Dominion.

Respectfully submitted,

A. W. Wright,
A. Lavigne,
Chas. March.

Petitions were forwarded by the organized labor bodies of the Dominion to the House of Commons praying for the passage of laws, or the amendment of existing laws, to provide for the construction of public works by day labor; for the Government ownership of railways; for the repeal of the clause in the Seamen's Agreement Act not allowing an appeal after conviction; for the total prohibition of Chinese immigration; for the abolition of assisted immigration; for the issue of full legal tender paper money; for the payment of prevailing rate of wages on Government contracts; for the reduction of the hours of labor; for the constitution of a board of arbitration, and for the prohibition of the importation of workmen under contract.

On March 26th a deputation composed of Messrs. Urbain Lafontaine, A. W. Wright, Chas. March, A. Lavigne, and Geo W. Dower, accompanied by Mr. Lepine, M.P. for Montreal East, waited on the members of the Dominion Government, there being present Sir John Abbott, Premier; Sir John Thompson, Sir A. Caron, and Hon. Messrs. Ouimet, Carling and Smith. Your committee laid before the Government the various measures of interest to wage-earners. In replying to your committee the Premier said: "You have presented us to-day some very important suggestions and propositions which require, and I am sure will receive, the utmost consideration in view of the influence of the body to which you belong. I can promise you that my colleagues and myself will give them the most careful attention in our power."

Your committee also waited on the Hon. Mr. Ouimet, Minister of Public Works, in relation to the question of the insertion of a clause in all Government contracts calling for the payment of the prevailing rate of wages on all Government works. The Hon. Minister acknowledged the force of the arguments used and promished that his department would give due consideration to the request.

Hon. Mr. Tupper, Minister of Marine, was also waited on in connection with the Act recently passed providing for the proper inspection of gear and tackle used in the loading and unloading of vessels. Mr. Tupper informed your committee that the Act had been proclaimed and came into force on April 1st, 1891. Your committee would therefore recommend that the organizations at the various ports of the Dominion, in whose interest the law was enacted, will carefully watch the officials of the Government whose business it is to enforce the Act and demand that they perform their whole duty.

The only Bill in the interests of labor introduced in the House of Commons during the past session was one by Mr. Gordon, M.P, for Vancouver Island, amending the Chinese Immigration Act. The provisions of the Bill were in the direction of increasing the tax from $50 to $100 and decreasing the number of Chinese allowed to be carried by steamships by one half. When nearing the end of the session the Government took charge of the Bill and passed the same, but in such a changed form as practically to leave the law as it was, unchanged.

About July 25th some members of your committee had their attention drawn to the fact that up to date none of the labor organizations in Ontario had registered under the Insurance Corporations Act, passed at the last session of the Ontario Legislature, and the time for registering under which had expired on July 1st. Your vice-president and secretary took upon themselves the responsibility, on behalf of bodies affiliated with the Congress, of applying for the non enforcement of the Act until the meeting of Congress. The request was granted (the document will be be laid before the delegates), and the time has been courteously extended until October 31st, 1892.

In conclusion, your committee would recommend that the incoming executive committee continue on the same lines, as near as possible, as those pursued by the committee of the past few years, for your committee are of opinion that the time is not far distant when the demands of labor must be granted.

All of which is respectfully submitted,

(Signed),

Louis Z. Boudreau.	Urbain Lafontaine, *Chairman.*
George Gale.	George T. Beales.
Luc. Routier.	A. W. Wright.
Chas. March.	A. Lavigne.
	George W. Dower, *Secretary.*

A special committee to whom the foregoing report was referred for consideration on the second day, recommended concurrence therein, with a recommendation that labor organizations in the Province of Quebec seek the establishment of free libraries through the municipal authorities rather than by the Provincial Government, and that, if required, legislation be secured granting the necessary power to said municipalities. This was adopted.

President's Annual Address.

President Lafontaine, in delivering his annual address, spoke as follows :

Fellow Delegates,—I feel specially honored in being permitted to preside over your deliberations, and to welcome you to this Eighth Annual Session of the Dominion Trades and Labor Congress in this city of Toronto, so well known for her devotion to the labor cause and her constant readiness to defend and protect the interests of labor.

1. With perhaps the exception of the Province of Ontario where certain useful measures have been adopted, as stated in the Legislative Committee's Report, the result of the past twelve months' work, in what relates to labor legislation, has not been very satisfactory. Our legislators, as a rule, are ill-disposed towards the measures we propose. Our friends are few and our foes many. But we must not allow ourselves to be discouraged. It is our duty to pursue our course with renewed energy and activity until our efforts are crowned with success.

2. The necessity of having some one to attend the sessions of Provincial Legislatures, as well as those of the House of Commons, presents itself to your consideration. Men of experience should be selected to watch the legislation of those different bodies. Such action would be of undoubted benefit to labor.

3. Your president should be empowered to visit the different places where his presence would be useful either in securing needed legislation or in promoting our welfare.

4. The time has arrived for this Congress to enlarge its field of operations, and to take an active part in all matters pertaining to the rights of labor.

5. All labor organizations of Canada, without exception, should rally around our Congress and give it all the aid and support necessary to attain its aims and objects.

6. Several important measures will be submitted to you for consideration. Among these the Chinese immigration question should receive your special attention, and a strong resolution should be passed condemning the importation of such an undesirable class of immigrants into Canada. We should concentrate our efforts to try and relieve our fellow-workers of British Columbia from this plague.

7. I call the attention of our legislators to the brutal usurpation of the police as well as the military powers by private detective agencies. Late events have given bloody examples of the work of these agencies in a neighboring country, and steps should be taken to prevent such illegal interference in this land. The law provides, and is strong enough, for the protection of all citizens without the State turning over its powers into the hands of irresponsible persons.

8. I suggest the appointment of a committee to draw up rules and regulations for the establishment of a board of arbitration and conciliation. Existing laws on the subject having failed to give satisfaction ; they should be reconstructed so as to meet the views of the Congress, and be more effective. Such boards are of great benefit to commerce and industry in England and other countries, and they could be made so in Canada as well. The committee should report during the present session if possible.

9. The reports of the different legislative boards, as well as of the executive board, will be submitted to you for approval.

10. The committee appointed for the revision of the constitution is ready to report its work. Great attention should be paid to its adoption, for it embodies the fundamental principles which are the basis of this great institution. Have the constitution as perfect as possible before adopting it.

11. You also have before you the secretary-treasurer's report, with all the necessary items. In point of number we keep our ground pretty well, but we should make an effort to give this body more power, both financially and numerically.

12. I call the attention of the Ways and Means Committee to the fact that the revenues are altogether inadequate to the expenses, and means should to taken to raise the funds necessary to allow this body to extend its sphere of action and usefulness.

13. I return my most sincere thanks to the officers of the Congress for the help rendered me, and more especially to the secretary-treasurer for the efficient and able manner in which he has performed the duties pertaining to his office.

14. I now declare the Eighth Annual Session of this Congress open for the transaction of business and the adoption of such laws as will be beneficial to labor and mankind in general. May harmony reign in your midst, your deliberation be conducted with moderation, and your decisions be wise, just and conscientious.

The draft of a new constitution being presented and under discussion, section 1 of article II recited that "the Congress shall be composed of delegates duly elected and accredited from Trade Councils, Central Labor Unions, Trades Unions, and State, District and Local Assemblies of the Knights of Labor in the Dominion of Canada." An amendment to add thereto the words "Single Tax Associations" was defeated.

Section 2: "The basis of representation shall be as follows: . . . No proxy representation will be allowed, and all delegates must be members of the bodies they represent at least six months prior to and at time of election, etc." Moved to amend by adding after the word "election" the words "and to be *bona fide* wage-earners." Lost. Moved to amend the same section by adding after the word "election" the words "and that no civic or civil employee be received as a delegate." This was also non-concurred in.

Chinese Immigration.

A special committee, to whom was previously referred certain communications read to the Congress from labor organizations in British Columbia, presented a report which was concurred in, and was as follows:

To the Officers and Members of the Dominion Trades and Labor Congress:

Gentlemen,—Your Special Committee have carefully considered the communication from the Trades and Labor Council of Victoria, British Columbia, dated August 28th, 1892, as well as two communications from the Trades and Labor Council of Vancouver, B. C., of dates September 1st and 2nd instant—all three addressed to your body.

The communications from Victoria, among other things, recites as follows:

"We submit to you a statement of the grievances which oppress the wage-earners of this province, in the hope that we may succeed in enlisting your support in the coming session of the Dominion Parliament. Enclosed you will find a petition which sets forth and includes the voice of nine-tenths of the people, on the most important issues demanding settlement. Until the Chinese question is settled along the lines indicated, it is vain for us to hope for better social and economic conditions. One of the most important provisions of the Immigration Act is frequently evaded, viz., that clause limiting the number of Chinese to one for every fifty tons of a vessel's tonnage. In addition to the Chinese question, we have another question of growing importance, and that is the importation of a large number of Japanese into our province. A scheme is now about to be tried of working one of our principal coal mines with Japanese labor, and we would urge upon your honorable body the wisdom and necessity of assisting us in our effort to compel the Dominion Government to regulate the admission of Japanese by the same laws which must in the future govern the admission of the Chinese race into our Dominion.

"We desire also to draw your attention to the fact that ship building in this province is an industry which furnishes employment for a large number of men, who have been induced to locate here by the promised protection of a paternal Government, which, when opportunity offered, gave the contract for the building of the steamer "Quadra" to a foreign company, and found employment for foreign workmen, while our own men were compelled to stay at home in idleness, and pay their taxes out of the proceeds of past labor. This is an injustice which we strongly denounce, and the enormity is more apparent when the following figures are considered in connection with the original cost of the "Quadra," which has since been wrecked in northern waters:

Cost	$75,000 00
Cost to bring her from Clyde	4,000 00
Repairs	17,000 00
Cost of raising	5,000 00
Fixing machinery, upholstering, painting, etc	2,000 00
	$103,000 00

"Now the ship builders of this province submit that the cost of a wooden steamer, which would be more suitable for the navigation of B. C. waters, would have been in the neighborhood of $100,000, and the cost of repairs, should the same accident have happened to a wooden boat, would not have exceeded $2,000.

"The Eight Hours question also demands immediate attention, and the concensus of opinion here seems to be that pressure should be brought to bear on the Dominion Government, and, if possible, secure the insertion of a clause in all contracts let or public works entered upon by the Dominion Government, providing for the eight-hour working day.

"The above are questions in which we are vitally interested, and we respectfully ask you to help us to secure a recognition of our rights at the hands of a reluctant government."

ARTHUR D. DUTTON,
Secretary Trades and Labor Council.

Your committee, in relation to the foregoing, beg leave to submit the following recommendation for adoption, viz. :

That this Congress, after careful consideration of the subject in all its phases, declares the admission of Chinese a menace and undeniable danger to the moral, social, political and material interests of Canada, and should be totally prohibited ; and that as the presence of those already in Canada, as a general rule, entails extra and special expense on the whole people of such provinces as they sojourn in in large numbers, a special annual poll-tax of $100 be imposed on each and every Chinese person after a given date, and that each one be obliged to register at a named date and place, so that each one's place of abode may be ascertainable when necessary ; that the poll-tax referred to be payable into the funds of the municipality in which the Chinese person is living at a given time of the year, and further, that like laws respecting the importation, immigration and registration of Japanese be enacted.

This Congress concurs in the view that "the eight-hour working question demands immediate attention," and that "every legitimate pressure should be brought to bear on the Federal and several Provincial Governments, pending the abolition of the contract system, to secure the insertion of clauses in the laws of each that all contracts shall be executed on a basis of a working day of eight hours, or forty-eight hours in each week of six days. And further, that all Government contracts contain a clause binding the contractor or contractors to at least pay the rates of wages, as respects all parts of the work, prevailing in the locality where the work of construction is to be performed.

Your committee submit the following at length, so as to secure its publication in the offical proceedings of the Congress and otherwise, with the design of securing the serious consideration of all subordinate bodies, as well as at the same time furnishing them with reliable testimony on the Chinese question and other fit food for serious reflection :

VANCOUVER, B.C., September 1st, 1892.

Mr. George W. Dower, Secretary-Treasurer Dominion Trades and Labor Congress, Toronto :

DEAR SIR AND BRO.,—At a special meeting of the Vancouver Trades and Labor Council, held on the 20th ultimo, it was decided that resolutions in accordance with our views be drafted and forwarded to the Congress for consideration and action thereon.

Mechanics employed on the Dominion Government and C.P.R. buildings now being erected in this city are compelled to work ten hours per day in distinct opposition to the trade rules of the city, which are nine The Dominion Government and the C.P.R. (which are looked upon here as one and the same), appear to be bent on breaking up the trade unions. This matter of the hours of labor was brought to the notice of the Minister of Public Works, but he stated he was unable to interfere in the matter.

1. Considerable dissatisfaction exists among the people here, caused by the manner of compiling the voters' list. Nearly 2,000 voters were able to cast their ballots in this district at the last provincial election in 1890, while a few months later there were only 960 or thereabouts able to vote at the Dominion elections. In a city of 15,000 on this coast there should be not less than 3,500 votes registered. The Government can not be sure that the member from here represents the majority.

Chinese immigration is still the burning question of the day; and the more we see of them the more we are convinced of the great curse they are to this country. Incapable of improvement, they are nothing better than filthy harbingers of disease. Morality, they have none. Christianity they cannot conceive of except as a huge joke. We are sorry to say that many Chinamen are engaged in private houses and hotels as servants, in which capacity they find unlimited opportunity to steal provisions, and when a white man calls to sell his garden produce the Chinese servant tells him "no one home," but a few minutes later when a Chinaman hovers about the door, the mistress of the house is called to make purchases. They are also adept druggists in their own way, and as servants they have ceaseless opportunities of adulterating food with drugs almost unknown to white men, thus placing the female members of the household at their disposal and unscrupulous will. We hear of many divorces having been occasioned in the various cities of the coast by employing Chinamen to do housework. As a rule, where more than one Chinaman is employed, the head Mongolian hires all the extra help; the Tyhee generally draws their wages, pays himself a large percentage on "Bondage" account, etc., leaving but a small pittance for the slave, as it can be compared to nothing better than slavery; and ultimately this country will be in much the same condition as were the Southern States with their black population before the American Civil War.

One of the peculiarities of the Chinese life in this country is that of the harem. The females in these houses of assignation and gambling hells are imported as slaves properly speaking, they are nothing less, being sold when mere girls in China, maybe from some leper colony, and brought here to enrich the purchaser and importer. Chinamen in the bondage of a Tyhee or Highbinder are allowed to visit these harems at stated intervals and a percentage of his pay is deducted by the boss Mongolian to keep the institution in a flourishing condition, no matter whether the Chinaman visits the place or not. These dens of squalid infamy are frequently visited by thoughtless and intemperate men and by rural "tender feet" from the east, sometimes through curiosity, but it often happens that one visit is all that is required to place a man *hors de combat* for many years, if not for all time. These leprous Mongolian viragoes even stand on the streets at night-time soliciting the passerby; *Chinamen*, even, have recently been arrested for soliciting. The amount of disease that is thus spread about is almost incalculable, and physicians have been hopelessly baffled in their attempts to accurately diagnose the disease.

In corroboration of this we insert the following communication from the Vancouver *World* of a recent date:

Editor World,—The service you have rendered in calling attention to the case of Gup Gee, or Kum Hee, suspected of leprosy, merits public acknowledgment. The information now furnished through the press is as follows: On the one side (1) the girl was bought in a Chinese leper colony and illicitly trafficked in this country; (2) parties connected with the Chinese mission last autumn raised the suspicion that she was a leper; (3) Tom Chue thought her a leper a year ago; (4) Mr. Gardiner, formerly a missionary in China, pronounced her a leper, and (5) the Chinese avoiding the girl, special efforts were made to attract white people to her. On the other side, Drs. McGuigan and Wilson, having examined the girl, only found indications of eczema. This seems reliable evidence that leprosy has not discernibly manifested itself in the girl, but if the information supplied to the press and through it to the public be correct it leaves two matters of serious moment before the public mind: (1) A girl has been brought here from a leper colony, from a locality which, until disproved, prudence requires us to assume is relegated exclusively to leper families. If the girl be of leper family the disease, although not visible, is probably latent in her system. Latent leprosy might at any time become active. Although not a source of direct danger while latent, the day leprosy becomes active it might become communicable. (2) We are given to understand that the girl is held here as a slave in violation of this country's laws, and that her owner, by forcing on her a life of illicit character, is at least constructively guilty of systematic crime. It certainly seems time that the authorities should determine whether or not the laws are being deliberately outraged, and that the community should know whether importation from leper colonies are legal or illegal. Citizen.

Vancouver, August 29th, 1892.

We are still suffering from the scourge of small-pox introduced and fostered by the Chinese. Many thousands of dollars have been spent by the various cities and by the Provincial Government in stamping out this plague, and with but ill success, and the outlook for the future is gloomy indeed, for so long as they are allowed to land on our shores just so long may we expect to suffer from small-pox as well as all the other evils attendant upon their presence, some of which have been referred to in previous communications. In nearly every Chinese laundry in this city Chinamen may be seen from day to day, by anyone passing their open doors, standing there in semi-dress smoking opium, a nice object lesson for a respectable community.

Another point to show their cuteness. Whenever they go to school (Chinese school) it is always to a white female teacher; no case of them studying English under the tutorship of a white man has yet been noticed. But enough, it is impossible to do the subject justice without wearying you. We feel that our Government should follow the example of Australia in getting rid of the heathens The exclusion of the Chinese is the first, strongest and most vital plank in our platform.

We feel that the Government has practically refused to consider any matters referred to them by the council, and that any improvement desired must be attained through unanimous and concerted action in political aggression, and that your esteemed council will take immediate action, and, after preparing a platform, refer it to the different trades unions and councils throughout Canada for its ratification or suggested improvements; and that your executive receive the returns, and eliminate or add to any changes which may receive sanction in the unions, councils or assemblies.

If the rapid and effectual concentration of the wealth created by the toilers into the hands of the few, cunningly backed by unscrupulous politicians in the Houses of our Provincial and our Dominion Governments, be not checked, this fair Canada of ours will soon become a land of serfs.

2. Be it therefore resolved that we are not only in favor of initiation and referendum, but that we urge all union men from the Atlantic to the Pacific to demand that a Bill be passed by the Dominion House of Commons to that end, giving the people this method of a voice in making the laws whereby they are to be governed.

3. *Resolved*, that having no hope of receiving due consideration for our demands at the hands of the Dominion Government, we deem it necessary that a labor platform be promulgated by a labor party formed for the purpose of electing as many members to the various governmental bodies as possible, in the hope of being ultimately able to accomplish our ends; and, further, that the following clauses be inserted in the platform:

That, whereas the Chinese having become a menace to society and the health and peace of our country, therefore, we urge upon the Government the necessity of passing an exclusion law, or raising the tax on Chinese entering Canada at any point whatever to the amount of $500, and that each and every Chinaman or woman in Canada be taxed to the amount of $200 each year, and that the said tax be paid into the treasury of the municipality or city in which they may be found; and, further, that no naturalization papers be granted to persons of Mongolian origin.

4. That, whereas, the moral, intellectual and physical progress of the people should be the first aim of a government of the people; and as the toiling masses of the world are demanding a reduction of the hours of labor, it is the duty of the representatives of the people to use every endeavor and legitimate means in their power to bring about the desired end, therefore we strongly urge the adoption of a legal eight hour work-day.

And further, that, pending the abolition of the contract system on Government works, a clause be inserted in all Government contracts, binding the contractor to observe the local trades' rules of the district wherein he may happen to be employed, and that a penalty be exacted for every violation of the same.

5. That, owing to the confusion caused and enormous expense incurred by having to compile two separate voters' lists, we deem it advisable to have Provincial voters' lists used and to govern all Dominion elections.

6. That the Government should repeal the clause in the Seamen's Agreement Act, not allowing any appeal after a conviction for any offence, and to grant instead the right

of appeal in such cases; and further, that a proper Admiralty Court be established for all such cases or appeal.

7. *Resolved*, That in the opinion of this body an Alien Labor Law should be passed, preventing the importation of laborers under contract.

8. *Resolved*, That a law should be enacted to prevent the crews of vessels hailing from foreign ports working on shore, thus depriving resident 'longshoremen of their means of livelihood.

9. Our body would suggest that in the event of Congress drafting a labor platform that a clause be inserted looking to the abolition of the House of Senate, Ottawa, as they consider that body detrimental to the best interests of the people.

In conclusion, a resolution was passed by this (Vancouver Trades and Labor) Council adopting the preamble and platform of the Knights of Labor, which we hope will, to a certain extent, guide your estimable Congress in adopting a platform for the Labor Party.

Yours, respectfully and fraternally,

GEO. GAGEN,

Secretary, Vancouver Trades and Labor Council.

Your committee, referring by number to the main subjects referred to in the communications from Vancouver Trades and Labor Council, beg to submit as follows:

1 and 4. Incidental to Chinese question and eight-hour day. Already covered by recommendation to your body.

2. *Re* Initiative and Referendum. This question has already been legislated upon by your body.

3. As to the formation of a Labor Party and Platform. It is recommended that this question be referred to the executive for consideration and report at the next meeting of the Congress.

5. Concurrence is recommended in the resoultion that "owing to the confusion and enormous expense incurred by having to compile two separate voters' lists, we deem it advisable to have the Provincial Voters' Lists used in and to govern all Dominion elections."

6 and 7. The subjects embraced have already secured the attention of your body.

8. As to the crews of vessels working on shore. This subject is considered a matter for action on the part of local labor organizations.

9. Previous Congresses are upon record in favor of the abolition of the Dominion House of Senate, and the record has not been altered or rescinded by any subsequent action of Congress.

All of which is respectfully submitted

D. R. GIBSON, *Chairman.*
DANIEL CURTIN.
ROBT. EMMETT.
L. Z. BOUDREAU.
D. J. O'DONOGHUE, *Secretary.*

STATE BOARDS OF ARBITRATION.

A special committee on "Arbitration" presented the following report:

Your Special Committee on Arbitration begs leave to report that, in its opinion, it would not be advisable for the present to seek the enactment of compulsory arbitration laws, and would recommend that the labor organizations should meanwhile proceed to form permanent conciliatory boards in the following manner: The Trades Unions or K. of L. Assemblies in each locality to elect two representatives of each trade and invite the employers in each trade to appoint a like number. The representatives of each trade to meet as a separate board and select a president outside of their trade who shall be agreeable to the four members. And it shall be the duty of the conciliation boards thus constituted to tender their services for the settlement of all difficulties arising between employers and employees in their respective trades and localities, and to keep a record of their proceedings.

A motion to amend was concurred in, as follows :

That all the words in the report after "that" be struck out, and the following substituted :

"In its opinion that method of settling disputes between employers and employees should be adopted wherever possible, and for the purpose of facilitating this the Government should appoint a Board of Conciliation and Arbitration, whose services would be available at all times to aid in the settlement of such disputes."

Prison Labor.

It having been determined that whereas, the question of the disposition of prison labor is one of the utmost importance to the community and one which has claimed much of the attention of this Congress, therefore, be it resolved, that in the opinion of this Congress the system known as the "State Account" is the best solution before us at the present time ; and further be it resolved, that this resolution be referred to a special committee of five, for the purpose of preparing a report on this question, based on the solution above mentioned, for publication in our next report, the same to be presented to this Congress at the present session. The special committee to whom the same was referred reported as follows, and the same was concurred in, viz. :

A proper consideration of the whole question of prison labor involves a consideration of so many other questions, among which the labor question is but a part, though all are so intimately connected that a proper understanding of one part is not complete without some knowledge of the others. It will be obvious, therefore, that in a report of this nature it is utterly impossible to enter fully into the many questions affecting this one of prison labor. To those who desire to go fully into the question and to investigate for themselves, we cannot do better than refer them to the report of the commissioners appointed to inquire into the prison and reformatory system of Ontario in 1891. In that report the searcher after facts will find abundance of such dealing with the causes of crime and the many systems of punishment and reformation, hereditary tendencies, juvenile crimes, drunkenness, idleness, punishment as a deterrent of crime, and industrial and educational systems of reformation. These questions are all fully and comprehensively dealt with. and your committee have no hestitation in declaring that if organized labor desires to speak and to be heard on this important question, which affects not only themselves but the welfare of the whole community, it is the bounden duty of organized labor to honestly inform itself on all matters connected with the problem, and that it should be manly and independent enough to arrive at and present its conclusions, free of all political party considerations or influences whatsoever. Among the systems of labor adopted in prisons are what is known as the "contract system," the "piece price system," and the "State or public account system."

Regarding the necessity of industrial employment of prisons, there seems to be no difference of opinion among the most enlightened of those who have ever given the question their study, or of those who have had the management of prisons. Punishment and brutality as a deterrent of crime has become, or is fast becoming, among all enlightened nations, an exploded idea. Absolute idleness is so terrible and disastrous in its consequences that it is impossible to give it, as a system, a moment's consideration.

Insanity and death, both physically and morally, being the sure and speedy results of a system of enforced idleness and confinement.

Admittting, then, the necessity of labor in some form, it is our duty to find out in what way it will not be a menace to outside free labor. Of the three systems enumerated above the contract system is the one most universally condemned. The contract system is that by which the labor of the convicts is hired out to the highest bidder.

A committee of Congress of the United States reports the following as among the evils of the contract system : "The contract system is wholly adverse to reform, and, therefore, should be abrogated. The prisoners are treated as if they were so many dumb beasts, being driven to their daily tasks by men whose aim is to get a certain amount of work out of them each day."

Dr. Wines says: "It places, for the entire working day, all the prisoners contracted for to a great extent under the control of men with no official responsibility; men who see in the convict only so much machinery for making money; men who only, or at any rate, whose chief recommendation to the positions they hold in the prison is that they are the highest bidders for the human beings hired by them. It introduces into the prisons agents of the contractors, who for the most part have not only no interest in aiding the reform of the convicts, but are too ready to oppose it by offering mischievous indulgencies to the convicts as an inducement to further industrial efforts. The contract system works great injury to honest labor in many branches of industry. Investigations by committees of State Legislatures have shown this fact repeatedly. There is no room for doubt as to the evil effect of this system upon the interests of free labor."

The result of the investigations by the Commissioner of the Bureau of Labor Statistics of the State of New York is: "The contract system of prison labor is directly responsible to a great extent for the reduction of wages and loss of employment suffered by mechanics engaged in the same branches of industry which are carried on in the prisons."

By the "piece price system" is meant the system by which the State receives payment for the product of the labor of the prisoner upon materials and machinery furnished partly by such person and partly by the State.

This system is carried out in the Central Prison at Toronto. Mr. Massie states in his evidence before the commissioners that the Nelsons find all the raw material and the superintendents, but that the machinery belongs to the Government absolutely. This system is but the contract system under another form.

The supervisor of the New Jersey State Prison, in which there are from 870 to 940 prisoners, said in his report for 1887: "The second year's experience in working the prisoners under the piece price plan seems to afford no element of hope that either as a revenue measure or as a preventative of undue competition with honest labor will it ever be even as potent as the contract system which it supplanted. In its practical working it is but a modification of the old system, possessing all its evils and none of its advantages."

Another expert says: "The piece price system does more injury to the laboring classes outside, because it enables the contractors to sell their products at lower prices."

Under the State or public account system, the State furnishes machinery and material for the labor of the prisoners and markets the products of such labor thereon. That is, the State sells its goods direct on the market without the intervention of any contractor whatever, and receives the profit to itself.

This system is preferred by most of the experts above all other systems as being less injurious to honest labor and best suited for reformatory purposes.

Mr. Carroll D. Wright, the Commissioner of Labor, speaks very highly of this system, but would have it worked without the use of power machinery, tools and hand machines only being allowed. He says: "With such a plan in vogue throughout the United States there could be no complaint as to the effect of convict labor upon the rates of wages or upon the sale of goods either in price or in quantity. The convicts would be constantly employed under the direction and supervision entirely of the prison officers. None of the objections or disadvantages arising under the contract system or the piece price modification thereof, or under the public account system with power machinery, can be raised against this plan. The adoption of it would leave the State free to undertake the very best and most harmless efforts for the reformation of prisoners.

"The chief aggravation in the employment of convicts in productive labor arises from the use of power machinery."

While recognizing the high authority of Mr. Wright to speak on all matters concerning labor, your committee cannot endorse the suggestion as to limiting the industries to the use of tools or hand machinery.

Warden Brush, of Sing Sing, says: "When the contract system was abolished almost everyone was of opinion that the prisons would run into extravagance and corruption, and that it would be impossible to manage them honestly under State account system. This theory is entirely contradicted by our experience here for the last twenty months."

After carefully considering the question fully your committee are unanimously of the opinion—

1st. That the "Public Account System" is the best solution of the difficulty yet offered, so far as it goes, and would strongly recommend that its general adoption be persistently urged upon both the Federal and Provincial Governments by all organized labor bodies.

2nd. That prisoners should be given an interest in the product of their labor. That a fair share of his earnings should be retained for the benefit of the prisoner, or be given to the families of prisoners, if in destitute circumstances.

Speaking on this phase of the question, Mr. T. V. Powderly says: "Keep what is given to the contractor of their (the prisoners') earnings and give it to themselves when they leave prison, or allow their earnings to go to the support of their families, instead of throwing these families on the charity of the town, while the prison contractor reaps a reward from crime that causes him to wish that the crop of criminals may grow larger."

3rd. That where the establishment of any prison industry will the least affect outside labor, or at most only affect a comparatively small number of wage-earners in that industry, sufficient notice should be given of the Government's intention to start such an industry, and that after the expiration of such notice it shall be considered a Government industry and shall be pursued against all comers.

It has been objected to this suggestion that the men upon serving their term would have no knowledge of any other occupation that would be useful to them after they got out of prison. To this objection your committee submits that it might not be inconsistent with the general good of the community that where such an industry was of sufficiently large proportions, suitable arrangements might be made whereby a certain amount of free labor might be employed in the same institution. Such arrangements are now made, we believe, under certain circumstances.

Insurance Corporations Act.

A special committee on the Ontario Insurance Act, 1892, reported as follows: The special committee appointed to report what changes are required in the interest of labor organizations in the Insurance Corporations Act of Ontario, begs leave to report as follows:

After a long and careful consideration of the provisions of the Act, in which your committee received valuable assistance from Mr. W. J. Vale, of the Office of the Registrar of Friendly Societies for the Province, it was decided to recommend:

That such amendments be sought as shall have the effect of exempting from its provisions all trades unions and *bona fide* labor organizations.

In order that the exemption of such trades unions and *bona fide* labor organizations may not leave the door open for evasions of the proper provisions of the Act, aimed at such insurance or benefit societies as ought to be prohibited from transacting business, it is recommended that the following definition be inserted in the Act:

"The term 'trades union or *bona fide* labor organization' means such combination, whether temporary or permanent, for regulating the relations between workmen and employers, or for imposing restrictive conditions on the conduct of any trade or business."

Moved in amendment to the motion to adopt the report: That the recommendation of the committee be expunged and the following inserted instead: that this Congress, in view of difficulties under which many labor bodies labor in respect of the provisions of the present Act, do petition the Registrar of Friendly Societies to extend exemption from its provisions to all trade organizations until the next session of the Provincial Legislature, with the view of enabling said organizations, through the Executive Committee of this Congress, to secure the incorporation and the passage into law of certain amendments to the existing law which will the better enable them to comply with its provisions respecting benevolent features.

Moved in amendment to the amendment: That exemption from the Act be asked for all International Unions.

After a lengthy and spirited discussion it was, on motion, resolved: That a committee of two wait on the Inspectors of Insurances and ascertain if he would extend the time for registering under the Act.

This committee lost no time in seeing the Inspector of Insurances, whose office was convenient, and on returning to the chamber in a few minutes after, announced that the Inspector had considerately extended the time for registration till May 1st, 1893, to meet the wishes of the Congress. A vote was then taken, the amendment to the amendment was lost and the amendment carried, and the report as amended adopted.

Other Resolutions.

Independently of the foregoing subjects dealt with through reports of the several committees, the following is given as a summary of the most important resolutions dealt with on their respective merits and adopted, viz:

That this Trades and Labor Congress, composed of regularly elected snd credentialed delegates of *bona fide* labor organizations throughout Canada, having a knowledge that for years past, and at the present time, the labor market of the Dominion has been and is constantly overcrowded in all its branches, mechanical and manual; be it therefore resolved, that the expenditure of any public money, directly or indirectly, for the purpose of assisting, bonusing, encouraging or decoying immigrants of either or both the classes mentioned, adult or juvenile, from abroad to Canada is unnecessary and unjustifiable under such circumstances;

Be it resolved further, that as a consequence of the existence of such a condition of the labor market in the Dominion of Canada, the existing unjust and misleading system of Dominion immigration, as well as like expenditure on the part of all the provinces except British Columbia, should be abolished, and only those possessed of financial wealth should be encouraged to the country;

Be it resolved still further, that it be an instruction to the Executive or Parliamentary Committee of this Congress to prepare and present to the Hon. the Minister of Interior and Immigration for Canada, and the several Emigration Bureaus of the Provinces, a duly certified copy of this resolution, and that they press upon their attention the great importance of this subject to workingmen; also that a certified copy of the same be forwarded to His Excellency the Governor-General, for such action as to him may seem most desirable.

That on account of the numerous railway accidents which are reported as occurring through officials working too many hours without intermission, this Congress recommends the enactment of a law declaring that engineers, firemen, conductors, switchmen, telegraph operators on railways and brakemen, shall be allowed to work only 8 hours in every 24.

Whereas a great number of institutions subsidized by the Government of the Province of Quebec are making great competition in the printing trade and other industries; therefore be it resolved, that this Congress request the Legislature of Quebec to give no subsidies to institutions making competition in such industries.

That this Congress recommends to the Federal and Provincial Governments, and also to Municipalities and School Boards, that they give all contracts for printing, binding and other supplies to firms where the recognized standard rates of wages are paid, pending the establishments of printing bureaus, giving the preference to such as recognize organizations among their employees.

That this Congress is in favor of the system known as the "Initiative and Referendum," in matters of legislation. That it be an instruction to the Executive Board to have prepared petitions to be signed by organized labor bodies and forwarded to the Federal and Provincial Governments, with a view to secure such changes in our system of government as will enable the people to directly initiate and control legislation, by the adoption of—

1st. The Initiative by which the voters of any Municipality, Province, or the Dominion may demand the submission of a new law or the alteration or abolition of any existing law within the jurisdiction of the body to whom the demand is presented. Upon the demand being presented it shall be the duty of the Municipal Council, Legislative

Assembly or Dominion Parliament, as the case may be, to prepare an Act in accordance with the terms of the demand and submit to the popular vote for approval or rejection. If approved it forwith becomes law.

2nd. The Referendum, a provision by which all enactments of a general nature do not become law until three months after they have been passed by the representative body. During those three months the voters may demand that the measure be submitted to the popular vote.

That the Federal Government be petitioned to reduce the rate of postage on letters to two cents, and that the one-cent rate on drop letters be restored.

That whenever tenders are called for by either Federal or Provincial Governments, or by any Municipal Council for the building of any public work or the performance of any public service, and where, in the building of such work or the performance of such service, workmen will be employed belonging to a trade or calling in which there is a usual and commonly recognized scale of wages, the specifications shall contain a clause that the successful tenderer shall pay the rate of wages prevailing in such trade or calling in the municipality in which the work is to be performed, or forfeit his contract.

That this Congress hereby requests that the Dominion Government, as soon as possible, make it a criminal offence to estabish or retain private detective agencies in this country.

That this Congress request the Legislature of Quebec to establish, as soon as possible, the system of free schools and free school books in that Province.

That the Executive Committee of this Congress be instructed to urge upon the Government the justice of making the following changes in the Municipal Law of the Province. 1st. The adoption of manhood suffrage in municipal elections. 2nd. That the first day of January in each year, when not a Sunday, be declared the legal day on which the annual municipal elections are to be held. 3rd. That in all elections, whether Federal, Provincial or Municipal, the hours of polling extend to eight o'clock p.m., and that polling day be declarnd a legal holiday.

That the Act entitled "The Mechanics Lien Act of Ontario," should be so amended as to secure to mechanics and laborers, besides the rights provided for in said Act, a lien or first claim on any rent or other income derived from any building on which they have been employed, to secure payment of wages, and that interest on mortgages shall be considered as income for that purpose.

That the Government of the Province of Quebec be requested to enact a law giving to workmen a first lien on what they produce.

That in the opinion of this Congress, the right to exercise the franchise on the same qualification as that under which men may vote, should be extended to women; and that it be an instruction to the Executive Committee of this Congress to urge the matter upon the Federal and Provincial Governments.

The following resolution involved two amendments:

With respect to the rights of labor we affirm the following: The earth, with its lands, forests, mines and other natural opportunities, is the gift of Nature, not to a part but to the whole of humanity. Whilst men have an unquestionable right to charge for the crops they raise, the houses they build, the services they render, we denounce as utterly unjust that any man should be allowed to charge for the land and other natural gifts that he never made. The value that accrues to land from the presence and concentration of population should not go to the enrichment of speculators and collectors of ground rent, but should be applied to public purposes. To impose taxes on improvements is to discourage the beneficent use of capital in the employment of labor and enrichment of the country, whilst encouraging its use injuriously in speculation and monopoly. Therefore be it resolved that we urge the Provincial Governments to grant municipalities the power to remove all taxes from the products of industry.

Moved in amendment: That the following words be added after the word "industry." And be it resolved further that we urge upon the Dominion Government the removal of all duties and imposts levied on the products of industry, either imported or manufactured in the country, except such as are levied with a view to restricting the use and consump-

tion of any article or product held to be injurious, and the substitution therefor, as a means of raising the revenue required for the government of the country, of a single tax on land and natural opportunities.

Moved in amendment to the amendment, and carried: That the motion and amendment be not now concurred in, but that they be ordered printed and forwarded to the labor organizations of Canada for consideration and action, so as to enable their delegates to the next annual Congress to vote in accordance with the expressed desire of their constituents in the event of such a resolution being introduced.

Moved and seconded that: Whereas the laboring classes can only attain the highest welfare by the fullest development of the natural resources and commerce of the country, and whereas it is essential to attain this end that the country shall enjoy complete autonomy, and that its Government should have full power to deal with all domestic or international questions, without regard to the interests or desires of any foreign nation; and whereas Canadians have shown by their experience of nearly a century their ability for self-government; therefore be it resolved that this Congress petition the Canadian Parliament to take the necessary means to secure the establishment and recognition of the independence of Canada.

In amendment thereto: That the resolution lay on the table until next session of this Congress, and that it be an instruction to the Secretary to have copies of the same forwarded to each body represented or subscribing to this Congress for discussion, they to be instructed to have a vote taken in their respective bodies, and to return the result of the same.

In amendment to the amendment: That owing to the great conflict of opinion as to the political future of this country, this Congress petition the Dominion Government to submit to a popular vote the following questions: The maintenance of our present colonial status; Imperial Federation; Canadian Independence; Political Union with the United States.

It was ordered "that the Secretary be instructed to have the foregoing resolutions printed and forwarded to all organizations, and that a vote be taken on the same, and the result returned to the Secretary."

Whereas the masses are interested in and bear their portion of the expenditure of all municipal moneys; therefore be it resolved that it be an instruction from this Dominion Trades and Labor Congress to its Executive Committee to petition the Legislature of the Province of Ontario to so alter or amend the Municipal Act as to allow the entire electorate of municipalities to vote on all money by-laws.

Whereas it has been shown, by the experience of recent elections in the Province of Ontario, especially in cities, that the clauses of the Assessment Act intended to provide for the placing on the rolls of those entitled to be voters under the Manhood Suffrage Act are totally inadequate to effect the objects sought; and whereas such failure of these clauses has the effect of disfranchising many workingmen through no fault of their own; therefore be it resolved that this Congress urge on the Ontario Legislature the advisability of replacing the present unworkable method of preparing the voters' lists for Provincial and municipal purposes by a simple system of registration; that petitions in favor of such a change in the law be prepared and forwarded, and that the Executive Committee be instructed to take all possible steps to have this reform effected.

That this Congress, while strongly urging all workers, whether organized or not, to use all endeavors to bring about a reduction in the hours of labor, requests that all public works, whether Municipal, Provincial, or Federal, be done on the eight-hour system.

It being moved and seconded "that this Congress hereby records its opinion that an eight-hour work day is desirable, and that such day can best be secured by Act of Parliament,"

An amendment was offered, and, after discussion and a vote, declared lost, viz.: That all after the word "that" in the first line of the resolution be expunged, and the following substituted: "While alive to the value of legislative assistance on the part of Parliaments or Legislatures, this Congress considers the best mode of securing an eight-hour work-day is by labor organizations and wage-earners determining and refusing to work more than eight hours in any twenty-four hours in a week of six days."

That this Congress protests against Government employees being allowed to work for private individuals and contractors while under salary, believing that such officials should receive pay sufficient to avoid the necessity of working extra hours, and competing in the already overcrowded labor markets.

That while the organized workmen of Canada are equally desirous with any other class in the community of seeing the unsettled portions of the country settled, be it resolved, that we call upon the Governments, Dominion and Provincial, to set aside a sum of money for the purpose of aiding agricultural laborers and others, now in Canada, who may wish to avail themselves of the opportunity to work on the land, and who are at the present time in enforced idleness in the large and small cities of this country, believing such action would be a benefit to this Dominion.

That provision should be made under the Factory Act that all rules and regulations formulated by employers for the governing of their employees while in their employ, should first be submitted to the Attorney-General's Department, in order that such rules and regulations shall comply with the regulations of the law.

That the Federal Government be petitioned to establish a Postal Telegraph system throughout the Dominion.

That municipalities are naturally better able than Provincial Legislatures to judge as to how taxation for municipal purposes may be most equitably levied, and therefore it should be left to each municipality to decide upon the incidence of taxation.

That in the opinion of this Congress the minimum salary of letter-carriers in the public service should not be less than $600 per annum, and that it be an instruction to the Executive Committee of this Congress to use its best efforts in pressing this view of the case upon the Government.

A pleasing and delicate tribute is paid to the delegates to the Congress in the following extract from the columns of the Toronto *Globe*, of September 14th, 1892, viz:

"It is strange that workingmen, who select as representatives such men as are attending the meeting of the Dominion Trades Congress in this city, do not make better selections in choosing representatives in Parliament. The deplorable general average of the Parliamentary representation of constituencies, in which wage-workers are in a majority, shows that they still unconsciously retain the old faith in a governing and a governed class."

BRITISH TRADE CONGRESSES.

1868.—The first Trades Union Congress ever held in Great Britain convened in Manchester in the month of June, 1868. Its organization was in a great measure due to two main circumstances. Some time previously the Government of the day appointed a Royal Commission to inquire into the working and rules of Trades Unions, and coupled with this was a recent decision of the Lord Chief Justice, in the case of Hornby *vs.* Close, which virtually declared that Trade Unions, being in restraint of trade, could not enforce agreements in a court of law, and that, consequently, their funds and property were absolutely without legal protection. This decision was not anticipated in view of the fact that Trades Unions had been legalized in the year 1824. At the Manchester Congress thirty-four delegates were present and represented a union membership of some 118,367, in Manchester, London, Liverpool Bradford, Birmingham, Bolton, Leeds, Nottingham, Preston, Sheffield, Salford, Dublin and a few other places. The principal subjects discussed at this Congress included the absolute necessity of trade unions, foreign competition, political economy, the regulation of labor, the Factory Acts Extension Act, courts of conciliation and arbitration in trade disputes, co-operation, compulsory inspection of all places in which women and children are employed, the law of Conspiracy as applied to labor, coercion, picketing and intimidation, the Royal Commission on Trades Unions, legislation as regarded Trade Societies and their funds, and the necessity for Annual Trade Congress. The expenses of that Congress were met by the payment of a fee of ten shillings by each delegate as his share of the cost.

1869.—The second Congress convened in Birmingham, in August, 1869. There were forty-eight delegates present on behalf of forty organizations representing a membership of 250,000. The chief subjects of debate at this gathering were the enquiry by and reports of the Royal Commission and the unprotected condition of trade union funds. Papers were read and debated on questions of piece-work, overtime, limitation of apprentices, the protection of miners' lives, conciliation and arbitration, co-operation and industrial partnership, national education, assisted emigration, the objects and uses of Trades Unions, strikes and lock-outs. · Here also was first mooted the idea of direct labor representation in Parliament.

1871.—The third Congress did not meet till March, 1871, not being called together in 1870 as at first intended. On this occasion forty-nine societies were represented by fifty delegates. These forty-nine societies aggregated a membership of 287,430. The chief subject of the discussion by the Congress was the Bill respecting Trades Unions, introduced in the House of Commons by the Home Secretary, and the third clause of which re-enacted, with intensified force, the criminal provisions of previous statutes as interpreted by some of the judges. This entire section was most strongly condemned, and a large deputation waited on the Government, and urged its withdrawal. The Government yielded to the extent of omitting the objectionable clause from that Bill, but brought it in as a separate measure, and it was passed simultaneously with the Trades Union Act as the Criminal Law Amendment Act, 1871. Important discussion was also had on the Mines Regulation Bill, the truck system, the weekly payment of wages, the Factory and Workshops Acts, the employment of women and children, on convict labor, taxation, waste lands, emigration, and international fraternization of labor. At this meeting a system of order and regularity as to representation and payment of expenses was approved of, and which still continues. Here, too, a Parliamentary Committee, composed of five members, including the chairman and secretary of the Congress, was elected to watch events and to take such action as might be deemed advisable during the session of Parliament in regard to the matters discussed by and the decisions of the Congress. A noteworthy incident at this Congress was the appearance thereat of Mr. Samuel Plimsoll, who then first explained his proposals for securing the safety of seamen and who bespoke the aid of the delegates in the work he had undertaken.

1872.—The fourth Congress met at Nottingham in January, 1872. This early meeting was for the purpose of being ready with a programme of work for the ensuing session of Parliament. There were seventy-seven delegates in attendance, representing sixty-three societies and a total membership of 255,710, according to credentials. Twelve of the delegates were sent by political bodies, a system then for the first time authoritatively condemned and never since repeated—at least not with the consent of the Congress. The Parliamentary Committee elected at the previous Congress presented its first report, giving a synopsis of its action during its term of office, and this practice has been followed at all succeeding Congresses. The principal discussions were upon the two Acts having reference to Trade Unions and to the Bills to be introduced during the ensuing session of Parliament, namely, a Mines Regulation Bill, a Bill for the regulation of truck and ensuring the weekly payment of wages, a Bill for compensating the families of workmen for losses sustained by injuries inflicted while following their employment, and a Bill for amending the Law relating to arbitration in trade disputes. The Parliamentary Committee, after being increased to ten members and charged with the duty of preparing a code of standing orders for the government of future Congresses, was instructed to carefully watch the proposed legislation respecting friendly societies, and to agitate for the appointment of an efficient staff of inspectors under the Factories and Workshops Acts. On this occasion also it was determined that papers in defence of unionism were not necessary. A very notable event in connection with this Congress was that Nottingham set the example which has since been followed in other towns. The Mayor entertained the delegates to a sumptuous banquet in the Town Hall, and the townspeople threw open their houses to the delegates in a way most generous and surprising.

1873.—The fifth Congress met at Leeds in January, 1873. The number of delegates present was 132, representing 140 societies and 730,074 members. The report of the Parliamentary Committee was comprehensive and important. It dealt with the several

subjects mentioned in the Nottingham programme, and more especially the Mines Regulation Act and the Arbitration Act, both enacted in 1872, and with the Factories' Nine Hours Bill, the truck system, employers' liability and prosecutions under the Criminal Amendment Act. Resolutions appropriate to the these matters were introduced and concurred in, as was also one condemning the employment of soldiers in times of labor disputes.

1874.—The next and sixth Congress was held in Sheffield in January, 1874. Here 169 delegates reported. They represented 153 societies and 1,191,922 members. The business of this meeting was chiefly dealing with the Criminal Law Amendment Act, 1871, the Masters and Servants' Act, 1867, the conspiracy law, the Trades Unions Act, 1871, the jury laws, compensation for injuries, payment of wages weekly, the summary jurisdiction of magistrates, and federation of employers. Some discussion also took place as to federating trades unions, on merchant seamen, hours of labor, and the grievances of postal employees.

1875.—The seventh Congress opened its session in Liverpool, in January, 1875. The delegates reporting numbered 151, representing 107 societies and 818,082 members. The report of the Parliamentary Committee was elaborate, and for the most part covered ground attracting attention at previous meetings of the Congress. Most interest centred in the portion which dealt with the conclusions of the Royal Commission on Labor Laws, appointed by the Government on attaining office in 1874. The Congress rejected a scheme of federation which had been prepared and submitted by the committee, and it referred back a proposed new constitution for the Congress. Neither of these schemes has ever secured the sanction of Congress, although both have been discussed on subsequent occasions.

1875.—Owing to a resolution passed at the January Congress, changing the time of annual meeting, the eighth Congress met in Glasgow on Sept. 16th, 1875. This time only 139 delegates reported, and they represented 109 societies and 539,823 members. The Parliamentary Committee's report dealt with some twenty different subjects, but the chief topic was the workmen's victory gained by the passage of the Labor Laws in the session of the then current year While it was the celebration of a great triumph after years of hard and patient work, it became at the same time the starting point of a new departure, covering a wider field, both social and political. At this meeting Mr. Howell, Secretary to the Congress, resigned on account of ill-health, and Mr. Henry Broadhurst, M.P., was elected in his stead.

1876.—Newcastle was the place of meeting of the Congress on its ninth session in September, 1876. One hundred and forty delegates representing 113 societies and 556,488 members, presented credentials on this occasion. The report of the Parliamentary Committee covered twelve different subjects, the chief being the Trades Union Act, 1871, and the Amendment Act of 1876, which had embodied every improvement suggested by successive Congresses since 1871. Among the special subjects dealt with may be mentioned the extension of the provisions as to breaches of contract in the Employers' and Workmen Act, of 1875 to seamen while in British waters, the Lord Chancellor's rules for carrying out the before-mentioned Act, the report of the Royal Commission on the Factories and Workshops Act, and co-operation.

1877.—The tenth Congress took place at Leicester in Sept., 1877. There were 141 delegates in attendance, representing 112 societies and 691,089 members. The new questions introduced into the Parliamentary Committee's report had reference to the Justices Clerks' Act, 1877, the proposals for a Criminal Code Bill, the abolition of imprisonment for debt, Danish trade unions, and thrift. At this meeting Sir Thomas (now Lord) Brassey gave an address on Work and Wages in 1877, and on Labor at Home and Abroad.

1878.—The eleventh Congress met at Bristol in September, 1878. Sixteen subjects were dealt with in the report of the Parliamentary Committee. Of these the Employers' Liability Bill, the Factories and Workshops Consolidation Act and Merchant Seamen's Bill were the most important. The programme for the ensuing year was reduced to nine

subjects, no new topic being introduced. A very notable event of this Congress was a paper on "over-production," by Mr. John Morley, and which address was much commented on at the time. There were present 136 delegates from 114 societies and they represented 623,957 members.

1879.—At this, the twelfth meeting of the Congress, in Edinburgh, there were 115 delegates present from 92 societies and they represented 541,892 members. The Parliamentary Committee's report touched upon nineteen subjects, the most important being the Employers' Liability Bill and the Criminal Code Bill, then before Parliament, and the Summary Jurisdiction Act, 1879. Three new questions were added to the programme, namely, reform of the land laws, assimilation of the borough and county franchise, and the extension of the hours of polling.

1880.—The thirteenth Congress convened in Dublin on Sept. 16th, 1880, and was attended by 120 delegates, representing 105 societies with 494,222 members. The report of the Parliamentary Committee dealt with twelve subjects, the chief being the Employers' Liability Act of 1880, the Act for regulating the carriage of grain cargoes in bulk, and the Act extending the provisions of the Employers and Workmen's Act to British seamen. The only new subject introduced was the Irish Land Laws.

1881.—For its fourteenth session the Congress reverted to London, where it met in September, 1881, with 157 delegates from 122 societies and representing 463,899 members in attendance. The report discussed eighteen different subjects, some of which were outside their province of legislation. The committee referred with pride to the fact that one of their number had been appointed an inspector of factories under the new Act, and they intimated that this was but the thin end of the wedge, a prediction subsequently verified. Some noisy debates took place on the subject of "Fair Trade," mainly at the instigation of certain persons who had managed to get into the Congress as delegates. Eventually they were expelled.

1882.—The fifteenth Congress was held in Manchester. There were 153 delegates present, and they represented 126 societies and a membership of 509,337. The report dealt mainly with the Employers' Liability Act, 1880, Amendment Bill and codification of the criminal law, the Payment of Wages in Public Houses Prevention Bill, the inspection of factories and workshops, reform of the cab laws, land law reform, the Settled Estates Act, Registrars' charges for certificates of death, and Co-operation. The other questions discussed comprised the poor law system, the Public Health Act, the regulation of bake houses, and infant mortality.

1883.—Nottingham was where the Congress held its sixteenth session, in 1883. Here 163 delegates from a like number of societies represented an aggregate membership of 471,651. Only one new subject was dealt with in the report of the Parliamentary Committee. The most important subject for consideration was one of industrial organization—the projected labor conference in Paris.

1884.—The seventeenth Congress took place at Aberdeen, in 1884. There were present 142 delegates, representing 129 societies and 598,033 members. Savings banks, hours of labor, and international trades unionism were among the new subjects discussed. Lord Roseberry and Lord Aberdeen were present at this meeting, the former delivering an address. The increasing tendency to political action, which had been growing from year to year, again manifested itself at this Congress.

1885.—In 1885 the Congress met in Southport and 141 delegates presented credentials. They represented 136 societies and 580,976 members. The Parliamentary Committee's report dealt with some fourteen questions, two of which were new, namely, Government contracts and colonial questions. That which elicited the most attention of the Congress was the issue of a manifesto, in view of the approaching general election, containing questions to be supported and voted for by the candidates.

1886.—At Hull, where the Nineteenth Congress met, 143 delegates from 121 societies, and representing 633,088 members, were present. The most important features were that free education was added to the programme, and that a committee was appointed to consider the best means of securing labor representation in Parliament.

1887.—The Twentieth Congress was held at Swansea in September, 1887. It was attended by 156 delegates on behalf of 131 societies with a membership aggregating 674,-034. The report of the Parliamentary Committee dealt with fourteen different subjects, of which the right of public meeting in Ireland, trade marks, sanitary inspection and the revision of the statute law were new ones.

1888.—Bradford was where the twenty-first Congress met. Here 156 delegates presented credentials from 131 societies, representing 674,634 members. This meeting was mainly remarkable because of an able and exhaustve discussion on the proposed eight hours day.

1889.—The Congress met in Dundee in September, 1889. It was attended by 211 delegates, representing 171 societies and 885,055 members. Interest centred chiefly in the debate on the eight hours question, which came up for consideration, and in an attack on Mr. Broadhurst by the "new" unionists. After a heated and personal discussion, on motion of Mr. John Wilson, M.P., who was chairman, of the Standing Orders Committee, the Congress passed a vote of confidence in Mr. Broadhurst by 177 votes to 11. A resolution was moved "That this Congress instructs the Parliamentary Committee to take action on the following resolution: 'That the maximum working day be eight hours.'" A direct negative to this resolution was moved, as was also an amendment. In the division which took place on this question 88 voted for the direct negative and 63 for the motion. A vote was next taken on the amendment, which instructed the Parliamentary Committee to collect full information on the hours of labor of all classes in this country, and of corresponding workers in America, the colonies and the continent of Europe. There voted for the amendment 34, and for the previous question 87. Afterwards the Congress adopted resolutions in favor of amending the Employers' Liability Act, the law as to coroners' inquests in Scotland, labor representation in Parliament, and some other subjects mentioned in the report of the Parliamentary Committee.

1890.—The twenty-third Congress was held at Liverpool in September, 1890. The large number of 457 delegates were in attendance. These were from 311 societies with a membership of 1,470,191. The Parliamentary Committee's report dealt with the Load Line Bill, an Eight Hours Bill for miners, the federation of trades, income tax on trade union investments, and the Berlin Labor Conference. But the eight hours day was once again the question of questions. A resolution in favor of an eight hours day by Act of Parliament was carried on a vote of 193 for and 155 against. At this Congress Mr. Henry Broadhurst resigned the secretaryship of the Parliamentary Committee and was replaced by Mr. Charles Fenwick.

1891.—The twenty-fourth Congress was held at Newcastle-upon-Tyne in September, 1891. There were 554 accredited delegates in attendance. These represented 310 labor organizations with an aggregate membership of some 2,000,000. Among this number of delegates there were five women, three members of parliament and six justices of the peace.

As to the general character of the Congress it is well outlined in the president's address wherein, among other utterances, he says:

"Well, I see before me perhaps—indeed I think I may omit 'perhaps' and say—the largest and most representative body of trades unionists that ever has met within the boundaries of this Empire; I think I may go still further and say that has ever met anywhere in the civilized world. We have the unskilled laborers represented as they never were before. I hardly like to say unskilled. I would rather say less skilled, because all labor, even the rudest, requires a considerable amount of skill. All honor to the men who have organized these masses. I, for one, rejoice at their success. * * * * * Let me refer for a moment to the representative power of this Congress. I believe you represent something like two millions of workers Even allowing for some little exaggeration, that is an enormous number. And your strength is not to be measured by a million and a half or two millions. The organized, when they win a victory, win it for the disorganized as well as for themselves."

The income of the Congress for the year ending September, 1891, was £1,373 12s. 3d., while the subscriptions from the several bodies throughout Great Britain towards defraying the expenses of the Parliamentary Committee amounted to £1,817 9s. 10d.

At 12 o'clock on the 7th of September, Mr. E. Harford, chairman of the Parliamentary Committee, took the chair in the Town Hall. He was supported on the platform by the vice-president, treasurer, secretary and the whole of the members of that committee. After a short speech of welcome, Mr. Harford introduced His Worship the Mayor of Newcastle (Mr. Baxter Hill), who was accompanied by numerous members of the corporation. His Worship, in fitting terms, extended a hearty official welcome to the delegates to the Congress.

Mr. Thomas Burt, M.P., of the Northumberland Miners, was unanimously elected President of the Congress, while Mr. Geo. Shipton, painter, and Mr. William Inskip, boot and shoe operative, were elected vice-president and treasurer, respectively. Mr. J. J. Harris, of Newcastle Trades Council, was elected secretary.

The Congress elected as the Parliamentary Committee for the year 1891-92 the following gentlemen, viz.: Mr. J. Wilson, M.P., Miners' National Union; Mr. J. H. Wilson, Sailors and Firemen's Amalgamated Union; Mr. T. Birtwistle, J.P., Amalgamated Weavers; Mr. W. Inskip, Boot and Shoe Operatives' National Union; Mr. E. Harford, Amalgamated Society of Railway Servants; Mr. T. R. Trelfal, Southport Trades Council; Mr. J. Mawdsley, J.P., Amalgamated Association of Operative Cotton Spinners; G. D. Kelley, Lithographic Printers' Amalgamated Society; Mr. W. Matkin, Carpenters and Joiners' General Union; and Mr. J. Ingles, Associated Blacksmiths of Scotland. Mr. C. Fenwick, M.P., was unanimously elected secretary to the Parliamentary Committee for the term.

The great importance of the work of the retiring Parliamentary Committee—indicating clearly, as it does, the chief direction of the deliberations and work of the Congress and the subjects considered of the first magnitude for remedial legislation by organized labor in Great Britain—renders excuse unnecessary for the reproduction here, *in extenso*, of the report of the Parliamentary Committee, and which was as follows:

"Ladies and Gentlemen,—

"Experience has shown that as Parliaments approach the close of their natural existence they are much more disposed than at other times to consider the claims of labor.

"Although the past year has not been remarkable for legislation in the interest of the workers, yet it cannot be said that the claims of labor have been entirely neglected. This, no doubt, is due in some measure to the fact that, with the exception of the Irish Land Purchase Bill and the Tithes Bill, the Government have had no other measure of first-rate importance on hand, and consequently private members have had more time at their disposal than has usually been the case since this Parliament began.

"Early in the session Mr. F. A. Channing, who has for some time past taken great interest in the condition of railway servants, called attention to their excessive hours of labor and moved the following resolution, which was seconded in an able speech by Mr. John Wilson, member for Mid-Durham:—'In the opinion of this House the excessive hours of labor imposed on railway servants by the existing arrangements of the railway companies of the United Kingdom constitute a grave social injustice and are a constant source of danger both to the men themselves and the travelling public, and that it is expedient that the Board of Trade should obtain power by legislation to issue orders, where necessary, directing railway companies to limit the hours of work of special classes of their servants, or to make such a reasonable increase in any class of their servants as will obviate the necessity of overtime work.' Under ordinary circumstances a motion such as this was calculated to give rise to an important debate, but in this instance the interest was intensified by the fact that a large number of railway servants in Scotland had left their employment, demanding shorter hours and more reasonable conditions of labor.

"These circumstances directed public attention to the question to such an extent that, although the motion was defeated, the Government consented to the appointment of a select committee to inquire 'Whether, and if so, in what way, the hours worked should be restricted by legislation?' Your Committee regret that this inquiry was not concluded during the session, it having been decided to recommend the appointment of a committee to further consider the subject next session.

"During the past year several important judgments have been given in the Law Courts against trade unionists, under the Law of Conspiracy.

"The Conspiracy Act of 1875, as passed by the House of Commons, defined intimidation for which trade unionists were to be punishable, 'to mean and include only such intimidation as would justify a justice of the peace, on complaint being made to him, in binding over the person so intimidating to keep the peace.' These words, which were struck out when the Bill was considered in the House of Lords, would have rendered such decisions almost impossible.

"With regard to the judgment of Mr. Bompas, the Recorder of Plymouth, it is difficult to conceive a more foolish or absurd rendering of the law relating to strikes than that stated by him in the notorious case of Curran *v.* Treleaven. 'A strike,' says Mr. Bompas, 'for the purpose of raising wages or altering the condition of employment is lawful unless accompanied by violence or intimidation, but a strike for the purpose of compelling employers not to employ other persons, or to alter the terms of employment of such other persons, is illegal.' Such an interpretation of the law would render it impossible at times for workmen to dispose of their labor with freedom and upon conditions satisfactory to themselves, as the influence of 'such other persons' as those to whom Mr. Bompas refers, is often the sole and principal reason why unionists are unable to raise their wages or alter the conditions of their employment.

"Happily there has been obtained from a superior court, through the action of the London Trades Council—though not without considerable expense—a more rational and just interpretation of the law, and one which it is hoped will check any further tendency to strain it for the purpose of injuring trade unionists.

"Through the kindness of Mr. Edward Robertson who, last session, brought forward a Bill to amend the law relating to conspiracy and intimidation, we have been favored with the following:

"Memorandum on the law as left by recent decisions in the Law Courts.

"The Conspiracy Law Amendment Act of last session proposed to enact (1) that no combination shall be punishable (with certain specified exceptions) unless the object be criminal in itself, and (2) that intimidation under section 7 of the Conspiracy and Protection of Property Act, 1875, shall be limited to such intimidation as would justify a magistrate in binding over the person so intimidating to keep the peace—or in other words, to such intimidation as implies a threat of personal violence.

"Recent decisions have not removed the necessity for legislation on these lines. 1st: As to intimidation, the Queen's Bench Division, in the recent cases of the Queen *v.* Lawson, and Curran *v.* Treleaven, held that the facts therein proved did not amount to an intimidation within the meaning of the Act of 1875.

"In Curran *v.* Treleaven it is decided in terms that 'to tell an employer that if he employs workmen of a certain sort the workmen of another sort in his employ will be told to leave him, and to tell the men when the employer will not give way, to leave their work is certainly not intimidation.'

"In Gibson *v.* Lawson it is decided that to tell a workman that if he does not join a certain society his fellow-workmen, who are members of that society, will strike, is not intimidation. (In this case the resolution to strike was communicated to the employer, who thereupon dismissed the workman, in order to avoid a strike.) But the court does not attempt to define intimidation further than to say that it 'must receive a reasonable and sensible construction according to the circumstances of the cases as they arise from time to time.'

"The court does not decide—it expressly refrains from deciding—that intimidation 'must be limited to threats of personal violence,' althought it admits that 'there is much to be said for that view.' 'It may,' says Lord Coleridge, 'become necessary to

decide this point in time to come; it is not now.' This judgment upsets the construction placed on the Act by Mr. Bompas; but it does not settle the law as it would have been settled had the Conspiracy Bill of this year passed, or as it was actually enacted by the repealed Act of 1870. 2nd: As to conspiracy it has been urged that workmen are sufficiently protected by the Act of 1875, which exempts from the operations of the common law combination 'in furtherance of a trade dispute between employers and employed.' That these words are not sufficient to protect workmen is shown by a trial in the Glasgow Sheriff Court, on the 30th March last, when two men were convicted on a common law charge of conspiracy to deprive a man of the means of earning a livelihood by making threats to his employers that if he was retained in their service they would withdraw from their employment all members of the trade union.

"The sheriff directed the jury that there was no evidence that the illegal acts were done in furtherance of a trade dispute between employers and workmen, and therefore the exemption in the 3rd section of the Act of 1875 did not apply.

"The facts here are almost indentical in character with the facts in the case of Gibson *v.* Lawson. But in that case the accused was charged with intimidation and acquitted; while in the Glasgow case the men were charged with conspiracy and convicted. Acts which are innocent when the charge is intimidation, become criminal when the charge is conspiracy. In other words, acts which are innocent when done by one person become criminal when done by two or more persons in combination.

"The purposes of this memorandum may be summed up thus: The Act of 1875 enacts, as to a certain class of trade disputes, that a combination shall not be deemed criminal unless its object is in itself a crime—some exceptional cases being expressly excepted.

"This principle ought, subject to these exceptions, to be made a general rule of law. Its limitation to certain trade disputes has the appearance of conferring special privileges upon workmen, while in reality the Act is insufficient for their protection. It is in the interests of workmen, as workmen and as citizens, that instead of the common law doctrine and the limitation thereof introduced by the Act of 1875, there should be substituted the simple rule applicable to all men in all except a few exceptional cases that combination shall be criminal only when its purpose is to perpetrate crime.

"Your committee consider that the thanks of this Congress are due to Mr. Robertoon, and likewise to those who supported him in his efforts to amend the law in the direction indicated by this memorandum, and would suggest that he be requested to bring forward the Bill again next session.

"In this connection we strongly urge upon the trades the necessity of placing sufficient funds at the disposal of the Parliamentary Committee to enable them to engage the best legal advice in the interpretation on points of law, drafting bills, etc., as may from time to time arise out of or consequent upon the instruction of Congress.

"At the commencement of the session the Home Secretary, Sir Henry James, and Mr. Sidney Buxton each obtained leave to introduce a Bill for the purpose of amending the Factory and Workshops Act of 1878. These Bills, after obtaining a second reading, were referred to the Standing Committee on Trade. Mr. Wm. Abraham, Mr. George Howell and your secretary were added to the committee.

"After carefully considering the provisions of these Bills, we came to the conclusion, seeing that the resolutions of last Congress on this subject were provided for either in one or other of these Bills, that we should support the efforts of these gentlemen in preference to bringing forward another Bill on similar lines.

"The Act as amended, however, still leaves the law relating to factories and workshops in an unsatistactory state. We deeply regret that the proposal to extend its provisions to laundries and domestic workshops was rejected by the Government; as was also an amendment to provide for an increase in the number of factory inspectors.

"The proposal to raise the age of "half-timers" from 10 to 12 years was rejected through the obstinate resistance of the Home Secretary, notwithstanding the pledge given by the British delegates on the authority of the Government at the recent Labor Conference in Berlin.

"When the Bill was reported to the House, however, the Government were compelled by a hostile vote to accept an amendment which provides that in future the age at which children may begin work as "half-timers," under the Factory and Workshops Act, shall be 11 years instead of 10 as at present.

"Your Committee, in a letter addressed to the Home Secretary, expressed their disapproval of the course which the Government had taken in refusing to place laundries and domestic workshops under the provisions of the Act, and likewise in departing from the recommendation of the Berlin Conference with respect to the age of 'half-timers.'

"Whatever diversity of opinion may exist amongst us as to the propriety or otherwise of Parliamentary interference with the freedom of adult labor, your committee are of opinion that alike on physical, intellectual and moral grounds, it is most undesirable that children should be permitted to enter employment before they have reached at least 12 years of age.

"Your committee after considerable discussion drafted an Eight Hours Bill on the lines laid down by the Liverpool Congress, which was introduced by Mr. R. C. Graham, Mr. Abrahams, Mr. Conybeare, Dr. Clark and Mr. Randell, but owing to an unavoidable ballot, it was unable to reach a second reading stage.

"The Miners' Eight Hours Bill obtained the second place on March the 18th, first place having been obtained for the Welsh Local Veto Bill, which occupied the whole time of the sitting and consequently an opportunity for discussing the merits of this Bill was lost. Several members on both sides of the House importuned the First Lord of the Treasury to give an opportunity for the discussion of this measure, but he declined to do so.

"Your committee, although prepared to render every assistance, regret that there has been no opportunity afforded during the last session for the consideration of this Bill, in which a large number of miners are so deeply interested.

"Since 1888 the Government have made no serious effort to amend the Employers' Liability Act, notwithstanding their promise in each successive session to do so. The possibility of a private member being able to carry such a measure successfully through all its stages in Parliament is very remote, and unless the Government undertake the duty we fear the law on this subject must remain for some time in its present unsatisfactory state, but it would be better, in our opinion, to retain the law as it is than to accept the arrangement proposed by the Home Secretary in the Bill of 1888.

"Your committee, as instructed by last Congress, have prepared a Bill, which was introduced by Mr. Thomas Burt, at our request, the provisions of which, we hope, you will be able to approve. Mr. Burt obtained an unfavorable position in the list, and consequently the Bill could not be considered.

"The following particulars taken from a Government return will show the results obtained under the Employers' Liability Act from the 1st day of January to the 31st day of December, 1890:

"Number of Actions brought	388	
"Number of Actions in which damages were obtained	109	
"Total amount of damages obtained		£8,678 14s. 6d.
"Average amount of damages obtained		79 12 5
"Cases pending	54	
"Cases settled out of Court	27	
"Cases withdrawn	59	

"The question of 'sweating' in Government Departments was raised during the session on a motion brought forward by Mr. Sidney Buxton, and seconded by your Secretary, in the absence of Mr. Broadhurst, who had previously consented to do so, but was prevented through illness. The resolution required that the Government in giving out contracts should insist upon the contractor observing the customs and conditions as to rates of wages and working hours prevailing in each particular trade, and that they should prohibit, as far as possible, the practice of sub-letting such contracts. The First Commissioner of Public Works, speaking on behalf of the Government, accepted the principle of the resolution, but substituted in place of the motion words which declare it to be the 'Duty of the Government in all Government contracts to make provision against

the evils disclosed before the Sweating Committee, to insert such conditions as may prevent the abuse arising from sub-letting and to make every effort to secure the payment of such wages as are generally accepted as current in each trade for competent workmen.' The amendment submitted by Mr. Plunkett was unanimously adopted by the House.

"Your committee regard with satisfaction the progress which has thus been made in the direction of securing trade rates of wages for those employed on Government contracts, and desire to express their thanks to Messrs Burt, Cremer, Rowlands, Howell and others for their valuable assistance in securing this benefit to those working under such contract; and trust that those municipal authorities who have not yet adopted the practice may be induced to follow the example of Parliament in this respect.

"After carefully considering the question of municipal workshops your committee resolved to make further inquiry in order to ascertain how far the existing law was sufficient to meet the case; and in the opinion of legal advisers no further legislation is necessary on this subject providing that the localities, through their municipal authorities, deem it advisable to establish such workshops.

"Your committee accompanied a deputation which waited upon the Home Secretary to protest against the unfair competition from which certain trades suffer, notably the mat-making industry, through the employment of prison labor. It is customary for the Government to let out prison labor to certain contractors, who employ such persons in manufacturing articles of domestic use which are sold in the open market at prices below which it is possible for employers employing free labor to produce them.

"Mr. Quilter, member for Suffolk, in introducing the deputation, stated that he had caused a return to be made from the reports of the Prison Commissioners of the number of persons employed and the different industries in which such labor was hired, and out of 1,107 persons whose labor was thus let out, there were employed in basket making 11; brushes and brooms, 90; ship's fenders, 1; firewood, 6; rugs, 14; slippers, 15 and in mat-making, 970.

"Your committee, in addressing the Home Secretary on this subject, whilst admitting that prisoners might reasonably be employed in producing articles for use in Government departments, protested strongly against any surplus production being offered for sale in the open market in such a way as to injure free and honest labor. The Home Secretary, in replying to the deputation, said that the practice of letting out prison labor had been resorted to in the hope that it would raise the price of prison-made goods, and thus prevent undue competition with free labor. He promised, however, that further consideration should be given to the subject in order, if possible, to remedy the evils complained of.

"The number of persons interested in the matter of the qualification of enginemen continues to increase, and the supporters of such a measure are no longer confined to the Labor Members in the House of Commons. This year the Bill was introduced by a Conservative member, Mr. Seton Karr, but it was unfortunate in not reaching a second reading stage. It will be re-introduced next session.

"Your Secretary gave notice early in the session of his intention to introduce a Bill to provide for payment of members, but as it is contrary to the forms of the House for private members to propose legislation involving Imperial taxation, the Bill was subsequently withdrawn.

"The practice of paying members, we may point out, is observed by every Legislative Assembly in Europe, and in the whole of our colonies, one of which—New South Wales—has returned thirty-six Labor Members to its Parliament.

"We have observed with satisfaction the recent utterances of Sir George Trevelyan on the necessity for such a reform, and suggest that the question should be submitted to candidates at the next general election and their promise to support it, if possible, obtained.

"There has been no Bill before Parliament during the session of such a nature as to enable us to carry out the instructions of last Congress in respect of certificates for sea-going shipwrights. We may also state that we have received a number of protests against the resolutions of last Congress from the carpenters and joiners, desiring that the matter be delayed until they had an opportunity of further stating their case to Congress.

"The question of education has again been dealt with during the last session, and a measure has been passed which concedes the right of the children to have their education free in elementary schools. It likewise goes far in the direction of providing all the funds necessary for this purpose. The date fixed for the commencement of the Act being 1st September, 1891, therefore its provisions are already operative. Whilst fully appreciating the progress which this measure indicates, your committee regret that Evening Schools were not included in the Bill, and that the principle of public control was not conceded.

"Your Secretary forwarded to the President of the Board of Trade the resolution of last Congress, requesting that steps should be taken to secure by international arrangement the prevention of the sale of falsely marked merchandise. The President replied that the question was occupying the attention of the Government, and expressed the hope that he would be able to lay before Parliament a further selection of papers on the subject. These papers have since been issued from which it appears that negotations are still going on, but in some of the countries concerned it is necessary to obtain certain alterations of the law before the points mentioned in the protocol can be signed by them, which to some extent accounts for the delay in this matter.

"The Postmaster-General has carried a Bill this session to amend the Postoffice Act which provides for the transmission by book-post of receipt and notice forms issued by Friendly Societies, and through the entreaty of Mr. Howell an assurance was obtained from the late Mr. Raikes that the provisions of the Act should apply to Trade Unions in the same manner as to Friendly Societies.

"Mr. Howell also introduced a Bill which was supported by Mr. Broadhurst, Mr. Burt, Mr. Wilson, and your secretary, for the purpose of exempting the funds of Trade Unions paying provident benefit to their members from liability to pay income tax upon their investments, but by reason of the lateness of the session no progress was made. It is intended, however, that it shall be reintroduced next year.

"We regret that during the year unfriendly relations have arisen in some parts of the country between the members of trade unions and co-operative societies. Disputes between those kindred associations add nothing, in our opinion, either to the dignity or progress of our cause, and ought, as far as possible, to be avoided. Some degree of friction will at times doubtless arise, even between the best of employers and their workpeople, but where there is an honest desire to consider each other's interests, such difficulties are rarely if ever insurmountable. Your committee view with satisfaction the proposals of the general secretary of the co-operative union for the formation of joint committees composed of equal numbers of trade unionists and co-operators for the purpose of dealing with any dispute which may arise in co-operative employment.

"During the recent strike between the members of the Seamen and Firemen's Union and the Shipping Federation at Cardiff, Mr. J. H. Wilson, the general secretary of the Seamen's Union and also a member of your Committee, was arrested on the charge of 'unlawful assembly,' and sentenced to undergo six weeks' imprisonment. After carefully considering all the circumstances of the case, together with the nature of the evidence for the prosecution, as reported in the press, and having due regard to the nature of the offence alleged to have been committed, we could not regard the sentence imposed otherwise than as a flagrant abuse of judicial authority. We therefore addressed a memorial to the Home Secretary, entreating him to recommend Mr. Wilson's release, or at least a mitigation of his sentence. The Home Secretary replied to our memorial by stating that he was unable to discover any sufficient reason to justify him in complying with our request. Whilst we have no desire to condone offences against the law nor to shield the law-breaker from the penalty attached to the nature of his offence, it is nevertheless impossible to deny that cases such as this tend to destroy rather than to promote in the public mind respect for law and order.

"Two Royal Commissions have been appointed during the year, one to inquire into the effects of 'coal dust' on explosions in mines, and the other to inquire into the general condition of labor.

"The names of those appointed to serve on the coal dust inquiry are Lord Raleigh, Sir William Thomas Lewis, Professor Dixon, Mr. Emerson Bainbridge, your Secretary, and Mr. Joseph Chamberlain as Chairman of the Commission.

"The Labor Commission is much larger in numbers as it is also much wider in the scope of its inquiry, having 'To inquire into the questions affecting the relations between employer and employed, the combinations of employer and employed, and the conditions of labor which have been raised during the recent trade disputes in the United Kingdom, and to report whether legislation can with advantage be directed to the remedy of any evils that may be disclosed, and if so, in what manner,' and is composed of the following gentlemen:—Lord Derby, Sir M. H. Beach, Sir John Gorst, Mr. Mundella, Mr. Courtney, Mr. Fowler, Sir E. Harland, Mr. J. C. Bolton, Mr. G. W. Balfour, Mr. Burt, Mr. Collings, Mr. Abrahams, Sir Fred Pollock, Professor Marshall, Sir W. T. Lewis, Mr. Austin, Mr. Mawdsley, Mr. Mann, Mr. Tait, Mr. Plimsoll, Mr. Trow, Mr. Hewlett, Mr. Livesey, Mr. Dale, Mr. Lindsay, Mr. Tunstill, and Lord Hartingdon as Chairman.

"For the purpose of facilitating the progress of the inquiry the commissioners have divided themselves into groups, each group dealing as far as possible with industries of a cognate character.

"As soon as your committee learned that it was the intention of the Government to recommend the appointment of such an inquiry, we sought and obtained an interview with the First Lord of the Treasury for the purpose of pointing out to him the importance of giving to labor equal representation with capital, if the scope of their proposed inquiry was to include an investigation into the condition of labor and the relations existing between employers and workmen. We regret that our representatives were disregarded, and a very considerable balance of power given to capital in the constitution of the commission. We therefore forwarded to Mr. W. H. Smith our protest against the indifference which had been shown to the interest of labor as compared with capital. We pointed out to him that no representation whatever had been given to those industries in which the evils of 'sweating' were most prevalent, and where the social condition of the workpeople is one of extreme wretchedness and misery, and considering the scope of the inquiry, the powers given to the commission to recommend legislation, it was all the more necessary that labor should receive its full quota of representation. The Government declined, however, either through entreaty or protest, to give way on this point, and thus, in the opinion of your committee, have wilfully biased the inquiry on the side of the employers.

. . . . . .

"The organization of labor continues to make satisfactory progress in all parts of the United Kingdom, notwithstanding the recent attempts of some private employers and directors of companies to check its development by refusing to confer with the secretaries of the unions. The North British Railway directors even went so far in this direction as to arrest the funds at the disposal of the Scotch railway men who went out on strike.

"For employers, most of whom delegate the management of their business to some person whom they consider best able to look after their business interests, to deny the right of their workmen to adopt a similar course is both unreasonable and unjust.

"However, in the face of such opposition our cause continues to progress, and by the exercise of reason and prudence, backed by firmness and a desire for conciliation, we may hope for still greater success."

President's Address.

On the second day of the session of the Congress the President, Mr. Thomas Burt, M.P., delivered his address. Having briefly thanked the Mayor and the inhabitants of Newcastle for the courtesy and warmth of welcome extended to the Congress, and coupled with these the pleasure of the Newcastle Trades Council and, in fact, the pleasure of the workingmen generally of the North of England, in having the meeting held in that ancient borough, he continued as follows:

"We are met from the South and the North and the West to build up rather than to destroy. (Cheers.) Fittingly enough this Labor Parliament meets in a very active industrial centre. The workmen in the North of England have for years, many

of them, been well organized—not too well. (Hear, hear.) We have also had our industrial conflicts—great battles on behalf of labor. The nine-hour struggle under the leadership of John Burnett (the present Labor Commissioner of the Imperial Board of Trade) (cheers) was fought and won on Tyneside. In some of these conflicts we have been defeated. We have never been discouraged; we have never been disorganized. (Cheers.) Even our very defeats have made us stronger and more determined to fight in the future on behalf of the right. (Cheers.)

"Well, I see before me, perhaps—indeed I think I may omit 'perhaps' and say—the largest and most representative body of trades unionists that ever has met within the boundaries of this Empire (cheers). I think I might go further and say that has ever met anywhere in the civilized world. (Cheers.) We have the unskilled laborers represented as they never were before. (Cheers). I hardly like to say unskilled. I would rather say less skilled, because all labor, even the rudest, requires a considerable amount of skill. (Hear, hear). All honor to the men who have organized these masses. I, for one, rejoice at their success. Because, as the very first step of progress, you must have organization. I am glad, too, ladies and gentlemen, that we have the women of this country more largely represented than they have been before. (Cheers). Women need organization even more than men, and wherever woman does the same work in quality and quantity as the men, she ought to ask for the same pay as the man. (Cheers.) And we ought to support her, not only on the grounds of justice and humanity, but on the grounds of self-defence in asserting that claim. (Cheers). Labor ought to be recognized as a whole. We don't want any classes or castes. (Applause). We want no barriers of race or color. (Cheers). Wherever the oppressor crushes, wherever an effort is made to lift the fallen, our sympathies and our help ought to go forth to aid the oppressed. It is one of our standing orders that papers in support of trade unions are unnecessary. Speeches in support of trade unions are also unnecessary. I should as soon think—standing near the birthplace of George Stephenson, of attempting to vindicate the locomotive engine or the railway system—they have vindicated themselves. (Cheers.) The locomotive, however, needs to be controlled and to be kept on the rails if it is to do effective rather than destructive work. And it is the same with trade unions, ladies and gentlemen. (Cheers.) We have won great victories in the past. We need not expatiate on those victories. A great change has taken place within my own memory. Twenty-seven years ago, when I delivered my first trade union speech, I remember we had few friends. I remember that we were told by the political economists that wages were settled by demand and supply entirely. Well, ladies and gentlemen, we have converted the political economists. (Applause.) Demand and supply is a factor, and at your peril you forget that! (Hear, hear.) But we have taught them that men are something more than machines—that they are not bales of cotton, or tons of coal, or hogsheads of sugar, but that they have affections, that they have a soul, that they have a will, that they are men, and that they must be treated as men. (Loud cheers.) They have had to add humanity to their political economy. I do not want to mention names, but take a man like Professor Marshall, with his firm grasp of political economy, combined with the recognition of manhood and the rights of the worker, and you see that we have made some headway.

"We were told then, too, that trade unionism always meant strikes. Some of the stupidest, some of the most foolish strikes I have ever known have been by non-unionists and of only partially organized men, and you may take this as a fact, that if the union once gets its feet fairly set in proportion to its power there will be a diminution rather than an increase of strikes. (Cheers.) The newer unions have, perhaps by their previous apathy or by the difficulties they have had to face, found themselves hemmed in all round. They hardly have their right of existence recognized. Their leaders are victimized; they have no weapon but strikes. But, as they become organized, you will find that strikes will diminish rather than increase. (Hear, hear.) Now, ladies and gentlemen, do not let me be misunderstood. Many of you know that I have faced unpopularity in order to avoid strikes, but I am not here to utter a wholesale condemnation of strikes. On the contrary, I am here to say that, in many cases, owing to the clatter and brawl of the machinery, owing to the deafness of Mammon and its blindness, I am here to say that, in

many cases, the workmen cannot get attention until he stops the wheels. (Cheers.) But the strike is an ugly weapon. I do not know whether any of you have tried to throw a boomerang. It is a very deadly weapon; but if it is not skilfully thrown it is is apt to come back and to hit and to wound the thrower. So it is, gentlemen, with a strike. We cannot give up the right to strike, however. We are glad that through the watchfulness of the London Trades Council, we have had our right vindicated before the law—(loud cheering)—showing that eternal vigilance is the price of liberty. But whenever we can have our difficulties and our disputes calmly argued and settled by the arbitration of reason, I venture to say that we are fools—almost criminals—if we resort to a strike. (Hear, hear.) One of the things, however, that trade unions have not wholly established is the right to ask and to demand of the capitalist, however powerful and proud he may be, that he shall receive and listen to your properly accredited representatives. (Cheers.) Now, the probability is that strikes in the future, when they do occur, will be on a larger scale than they have been in the past. (Hear, hear.) Workmen will refuse to blackleg; they will refuse to do it either directly or indirectly. They will refuse to supplant, so far as they possibly can, their fellows who, they believe, are striking and struggling for their right. And, gentlemen, I have not a word to say against that, and some of you may think it would be a wholesome lesson to the stupidest among the capitalists to teach them the value of labor by bringing, as far as possible, the whole of the industries of the country to a standstill. (Slight cheers.) I am glad that that has met with only faint applause. It is very attractive, and, ladies and gentlemen, I venture to say that if we were dealing only with the stupidest and the most tyrannical, I, for one, would not discourage that idea. But bear in mind that it is a very difficult game to play, and that it would hurt the innocent much more than the guilty—that the wealthy capitalist would hardly enjoy a single luxury the less. If you could carry on your strike long enough, and make it extensive enough to make him feel not only in his purse, perhaps the most vulnerable point, or, next to his stomach, the most vulnerable, and you could make him feel in his stomach also; but, long before you reach that thousands and ten of thousands of women and children and the bread-winners would have suffered, and perhaps many of them carried to a premature grave. (Hear hear.)

"Let me refer for a moment to the representative power of this Congress. I believe you represent something like two millions of workers. (Cheers.) Even allowing for some little exaggeration that is an enormous number. And your strength is not to be measured by a million and a half or two millions. The organized, when they win a victory, win it for the disorganized as well as for themselves. (Hear, hear.) Gentlemen, if you are, as I doubt not you are, thoroughly in earnest, if you are unaminous and determined, it is difficult, it is almost impossible to set a limit to what you may accomplish. (Hear, hear.) But we are not unanimous. We cannot but accept facts as they are. If you have brain and use your brain, if you think for yourselves, as you do, that of itself means difference of opinion. Some of our opponents look with a certain amount of complacency, not to say glee, upon our divisions. Don't let them mistake. We have our differences of opinion. But if they presume on that and attack us they will find that blood is thicker than water. (Cheers.) I am not going to minimize these differences. They are exaggerated by our opponents. We have nothing to gain by attempting to smother them. The best thing is to ventilate them thoroughly. But, after all, they are differences not so much in objects and in principles as in details and in means. They are not, perhaps, less important on that account. I am not going to dwell upon them. They ought to be thoroughly discussed, but it is not for your chairman to discuss them.

"Probably the great dividing line among us is as to the proper functions of the State. Some of you would ask little; you would ask simply that life and limb should be protected, that machinery should be properly inspected and that existing laws should be enforced. Others would almost demand a fundamental change in our whole industrial system—(hear, hear)—and make the State the sole, or almost the sole, producer and employer of labor. (Hear, hear and some applause.) Well, I am not going to discuss the point. Perhaps you will allow me to say that my own leaning is in the direction of self-help. (Hear, hear and cheers. It is hardly likely, however, that I, as a politician—a very humble one— would undervalue the machinery of State. (Hear, hear.) We know

that it has accomplished much for us ; we believe that it will do much more in the future. (Hear, hear.) You are acting honorably and constitutionally in using every legitimate weapon within your reach for the improvement of the conditions of labor. Apart from special labor legislation, there are many things, I would venture to say, hardly less important to the workman, that the State may do, and on which we, as regard general principles, entirely agree. Waste could be diminished, the burdens of taxation could be more equitably adjusted. (Cheers.) Intemperance, that great cancer that eats into the souls and bodies of men—(cheers)—might have a healthy public opinion directed through the agency of the State to check it at its source. (Cheers.) War expenditure—the substitution of the arbi ration of reason and common sense for war all the world over would immensely lighten the burdens of humanity. (Cheers.) Special privileges, monopolies, sinecures—we have been touching them, but they must be swept away. (Cheers.)

"Those who derive large incomes from land and mineral resources ought to bear some proportion of the burdens of taxation commensurate with the large revenues that they have received. (Cheers.) The land question—hear, hear—touches you at every point—it is a question of food, of health, of recreation, of life. We want to strike the fetters off the land. We want to do something to turn the tide of migration now running so strongly from the country into the towns, into healthier channels, and whatever the tenure of land system that may prevail, we want to insist upon it that the utmost in the shape of health, recreation and life should be got out of the land for the sustenance and well-being of our constantly increasing population. (Applause.)

"These are some of the questions, and beyond these there are others. Do not suppose that our programme is exhausted. Workingmen must see that outside their own special questions there are broader questions still. The great book of a hundred years ago was Adam Smith's 'Inquiry into the Wealth of Nations.' What we have to inquire into now is the cause and the cure of the poverty of the individual. (Loud cheers) We have learned to some extent the art of production—not too well. There is not such a thing as over-production if you look at the needs of men. The problem we have to solve in the future is the better distribution of wealth. We want to see that the worker shall have a larger and more equitable share in the wealth that he produces (Hear hear.) We want that the poor man's child shall have a fair chance in the race for life. You cannot have absolute social equality, but we want to give him at any rate the tools—(hear, hear)—we want to have every child well fed, well clothed—(hear, hear)—equipped with the ripest scholarship that can be afforded, in order that he may, as I have said, have the tools, and may be able to carve for himself his way to an honorable career, and become a credit to himself and a blessing to human kind. (Cheers.) These are some of the things we want; these are some of the things we are striving after. We want that individuals shall not here and there be raised to colossal proprietors, but that every man, the humblest, who is willing to toil, shall have fair play. (Cheers.) I sympathize somewhat with Browning's prayer—

'Make no more giants, God,
But elevate the race at once!'

"Still there is a touch of impatience in that prayer. (Laughter.) These short cuts to the millenium do not seem to be smiled upon by Providence. (Laughter.) It does not seem to be God's way of elevating men. We have to deal with things as they are. To my mind the giant and the dwarf are both abnormal. The millionaire and the pauper are both monstrosities, and, if we ever become a Christian and civilized nation, they will both disappear. (Loud cheers.) But, ladies and gentlemen, so long as we have the giants, no doubt you and I would rather everybody was six feet high—(laughter)—that would be levelling up—(laughter)—but in the meantime, my method is to utilize the giant. (Hear hear.) The main question to me is—is he a good giant? (Hear, hear.) Will he strike and crush and destroy, or will he lift, will he elevate, will he lighten the burdens of the dwarfs? (Hear, hear.) Therefore, you see, it becomes a moral and an educational problem that we have to solve.

"I believe that no man was ever nearer right than Joseph Mazzini—(cheers)—one of the grandest men of the century—cheers—when he told the workmen to put duty in the place of right. (Cheers.) 'The sole origin of every right,' he says, 'is a duty fulfilled.

(Cheers) Well, now, ladies and gentlemen, that is the key of the problem. If you take your stand upon right then let me remind you that cruel, inhuman things may be done while you are keeping strictly within the bounds of your rights. But if you appeal to duty, then you have a leverage that brings in the wealthy man as well as the poor—that throws a greater obligation upon the wealthy man than upon the poor man. But we all have our obligations. Power carries with it responsibility. Right carries with it duty. Don't imagine that it is only the wealthy that have their duties. You, gentlemen, the representatives, the accredited spokesmen of two millions of men, you have not wealth but you have what money cannot buy—you have the confidence of tens of thousands of men They will listen to you I will not say you can mould them. You cannot. But they will listen to you. If you perform your duty in your sphere, they will perform theirs in their sphere (Cheers.) And your representative power, let me tell you, carries with it an enormous responsibility. (Cheers.) Well, now, we recognize that responsibility. I speak for myself; may I speak for you? (Yes.) May I say we recognize that responsibility. (Cheers.) And we are determined, while we endeavor to do the right, to direct our power and our energies to the improvement of men, to strive not only to raise an individual here and there, but humanity as a whole to a greater position of material well-being, also to loftier heights of intelligence and of nobility of character than it has heretofore attained." (Loud cheers, during which the President resumed his seat, after having spoken a little over half-an-hour.)

A large and influential deputation, on behalf of the North of England Temperance Societies, was, on motion, received, and Mr. Guy Hayler, the Secretary thereof, read the following memorial:

GENTLEMEN,—The N. E Temperance League, working in the great industrial centres of North Yorkshire, Durham, South Northumberland and Cumberland, offer their heartfelt greetings to the Parliament of Labor. (Hear, hear.)

The temperance movement, in its organized form, was born among workingmen, and for half a century has found among them its most eloquent advocates and most self-sacrificing supporters.

It is now all but universally conceded that the drinking customs of our country are antagonistic to the welfare of all sections of the community,—(hear, hear)—and that they create burdens that press most heavily upon the wage-earning classes. The annual cost of drink, causing disease, pauperism, lunacy and crime, represents an enormous tax upon the income of the country, which is largely derived direct from trade and commerce.

It is also becoming more apparent every day that the scores of millions spent yearly in strong drink, if diverted into the ordinary channels of trade, would give a mighty impetus to every industry represented in the Congress. (Hear, hear.) It is not generally realized that we spend twice as much on strong drink as we spend upon all woollen, cotton and linen goods, and about nine times as much as we spend on coal for household use. (Cheers.) If this vast sum, which is now much worse than wasted, were but spent upon food, clothing and the promotion of home comforts, our home trade would reach a height of enduring prosperity altogether unprecedented. Admission to the best market in the world is blocked by the drink shop. (Hear, hear.)

We would respectfully appeal to this Congress to use its great influence in favor of the discontinuance of the meetings of trade societies in public houses—(cheers)—and we would plead with the members to do all in their power for the overthrow of a system that, through all its history, has been hostile to all interests of labor.

Once more we fraternally greet you, and cordially wish that the results of your deliberations may be to promote the lasting good of the great army of labor throughout our land

We are, T. W. Blackhouse, President, Scotland; James I. Wood, Chairman, Hartlepool; Jos. Lingford, Treasurer, Bishop Aukland; James Mackenzie, Hon.-Sec., South Shields; Guy Hayler, Secretary, Newcastle-on-Tyne.

After a vote of hearty thanks to the president for his brilliant address had been unanimously tendered,

Mr. John Wilson, M.P., said they had on the platform a gentleman from Chicago, who was engaged in the organization of the World's Fair. He had come over with a special request to give them an invitation. He (Mr. Wilson) had asked

him to find the means,—(laughter)—but he was there to give them an invitation to the World's Fair, and if they would give him five minutes he would address them.

Mr. Mills, of Chicago, then came forward and said that in two years' time the 400th anniversary of the discovery of America would be celebrated by the World's Fair in Chicago. It had been decided to hold, in connection with the Fair, a number of labor conventions. About sixty different Congresses had been already arranged. He had been appointed chairman of the committee which would control the Labor Congresses. All the labor organizations in America would take part. The Knights of Labor were represented on the committee, as was also the Federation of Trades representing the trades unions of America, the American Economic Association, and a large number of industrial and other societies not only at home but of other lands. The Congresses would be able to discuss their own questions, and international questions would be considered in a joint convention. He now invited eight of their members, who would have the right to assist in the arrangements. They were anxious for the English delegates who would represent the great interests of their country to be present, for they were willing to admit that for the organization of labor and for loyalty to their leaders and enthusiastic public spirit the trades unionism of Great Britain was unequalled anywhere. (Loud applause.)

Among the many important questions passed upon by resolution during the six days' session of this Congress may be mentioned the eight hours day, respecting government contracts, international arrangement of hours, Factory Act amendment, "that this Congress regrets that no action has been taken by the Government during the past year to carry out the resolutions of previous Congresses calling upon them to appoint additional workingmen, and, where possible, women as inspectors of factories, workshops, mines, bakehouses, railways, and other works throughout the United Kingdom of Great Britain and Ireland, and also India. Further, this Congress affirms its opinion that the present staff of inspectors is totally inadequate to be of service, especially where sweating and overtime so largely prevail, and hereby instructs the Parliamentary Committee to take the necessary steps to bring this question more prominently before the Government, with the view of getting additional inspectors, male and female, appointed without delay; and also to appoint additional workingmen inspectors for mines, provided they possess the necessary qualification; and that inspectors of factories be strictly prohibited, under penalty, from giving any notice whatever to employers, managers, or foremen as to when it is intended to inspect their works;" protection of seamen, payment of members of Parliament, payment of local election expenses, jury law amendment, "that this Congress is of opinion that the time has now arrived when the law relating to the empanelling of juries should be so altered and amended as to allow all workingmen entitled to vote at Parliamentary elections to become jurymen, and further, that all jurymen should be paid for their services the sum of 10s. per day; that the present system of calling the grand jury be abolished; that a person charged with misdemeanor shall have the right to object to the twenty jurymen; and that the Parliamentary Committee be instructed to bring a Bill forward next session seeking for alteration of the law in this respect;" as to contracts and fair wages, in reference to the Employers' Liability Act, "that this Congress expresses its strong dissatisfaction with the Government for not giving facilities for the consideration of the Bill to amend the Employers' Liability Act, 1880, introduced by Messrs. Burt and Broadhurst, M.P's., during the last session, and urges upon the Parliamentary Committee to press forward the measure again next session; and seeing that so little attention is paid to the urgent and repeated representations made to the Government on behalf of this Congress to deal with this question on the lines of the proposed Bill, we urge upon the various societies and trades councils to make this a test question at the next general election, that to be an instruction to the Parliamentary Committee to consider an amendment to Mr. Burt's Employers' Liability Bill with a view of modifying the right of successive appeals, so unscrupulously used by wealthy employers in defeating the ends of justice;" condemning the long hours worked by fishermen (75 per cent. work an average of 16 hours per day; 65 per cent. work 17 hours a day; and 100 per cent. work 15 hours a day—seven days a week); respecting enginemen's qualifications; in favor of a Miners' Eight

Hours Bill ; the protection of fishermen in cases where paid by a share of net profits ; as to labor representation, "that this Congress condemns the continued neglect of labor questions by the House of Commons, and regards drastic industrial reform impossible until, by concerted action, a strong and vigorous Labor Party has been returned to Parliament ; and in view of an early general election, this Congress urges upon the united trades of the country to seize every opportunity to select, nominate and return labor representatives, independent of party politics, to the House of Commons. This Congress further advises that a vigorous effort be made to return workingmen to all local bodies ;" as to laundries and the Factory Act, "That this Congress expresses its strong disapproval of the action of Mr. Matthews in refusing to admit the justice and importance of the laundresses' claim to the protection of the Factory and Workshops Acts ; and should the Government next session bring in its proposed Bill to consolidate the Factories and Workshops Acts of 1878 and 1891, this Congress instructs the Parliamentary Committee to introduce into the Bill a clause providing for the inclusion of laundries within the definition of factory and workshops. Failing the introduction of such a Bill by the Government, the Parliamentary Committee is instructed to introduce a Bill which will embody the above clause ;" for the abolition of property and rating qualification for seats on Boards of Guardians ; against the private inquiry system relative to the causes of accidental deaths in Scotland, as it has operated unfavorably in the interests of the industrial classes and favoring assimilation to the law of England, so that public inquiry should be instituted ; and that when such assimilation is being provided for, a clause be added giving the right to relatives of deceased persons to be represented at such inquiry, and give evidence and examine witnesses ; as to Trade Unions and inquests, "that in order to secure thorough investigation into all cases of fatal accidents to workmen, it be an instruction to the Parliamentary Committee to draft a Bill giving the representatives of the trade union of which the deceased was a member the right to attend such inquest on behalf of relatives of the deceased ; that such representatives may have the right to question witnesses and tender evidence as an expert in the particular trade ;" against State Arbitration ; as to sub-contracting, "that this Congress urges upon all sectional trades employed in the erection of buildings to use their utmost endeavors to eradicate sub-contracting and scamping in the building trade ; and that in future the only contract recognized should be either a whole or a joint contract. In case of a joint contract of sectional trades, all the contractors' names should appear on the original contract agreement, and any contract let by the original contractor, after the signing of the original agreement, should be termed a sub contract and should not be recognized by the operatives, nor should the sub-contractor be recognized as a legal employer ;" and as to Railway Inspection, "that this Congress, recognizing the principle of appointing practical workmen as factory and mine inspectors, are of opinion the principle should be further extended to railways, and that in all public works requiring the special sanction of Parliament, where temporary railways are used during their construction they shall be subject to the regulations of the Board of Trade ; and that the Parliamentary Committee is instructed to formulate and promote measures in Parliament to secure the same."

On the sixth and closing day of the Congress, the chairman, in determining a point of order as to what was to be done with a number of important subjects on the agenda paper, and which time did not permit coming up for action, took occasion to say in relation thereto as follows :

"I want to remind you again that any resolution not adopted to-day through lack of time will be handed in to the Parliamentary Committee for their consideration, not that they will be pledged to adopt them, but they will examine and utilize them to the utmost extent."

On motion it was then decided to remit to the Parliamentary Committee the whole of the resolutions that had not been decided upon and that they should meet as early as possible to consider them, and, if possible, to put them into operation. This closed the legislative business of the Congress of 1891.

1892.—The twenty-fifth annual Congress of the representatives of the Trades Union of Great Britain and Ireland, pursuant to adjournment, met in the City Hall, Glasgow Scotland, on September 5th, 1892, concluding its business on the 10th of the same month

As in the usual practice, the chairman of the Parliamentary Committee, Mr. John Wilson, M.P, took the chair and conducted the routine business until the Congress had elected a President.

Owing to the unavoidable absence of the Lord Provost, Bailies J. H. Martin and Graham extended a hearty welcome to the Congress on this its second time of holding its session in the City of Glasgow---the first time being in 1876. In doing so he said he felt sure the citizens of the second city of the Empire would be first in the manner and warmth of their hospitality to the visitors

In due time Mr. John Hodge, Am. Steel Smelters, Glasgow, was unanimously elected President, and Mr. A. J. Hunter, Trades Council, Glasgow, was elected Secretary; with Mr. George Shipton, Trades Council, London, as Vice-President, and Ald. W. Inskip, J.P, Bookbinders' vellum Account Society, as Treasurer The Parliamentary Committee for 1892 3 is composed of J. H. Wilson, M.P., James Mawdsley, B. Tillett, John Wilson M P., David Holmes, Wm. Inskip, John Anderson, Edward Harford, James M. Jack and John Hodge. On a vote of 273 to 174, Mr. John Fenwick, M.P., was elected Secretary of the Parliamentary Committee.

The number of societies represented at this meeting of the Congress was 418, and the number of delegates present 495—representing an aggregate of 1,219,931 members in subordinate bodies. The total income of the Congress was £1,214 15s. 7d. and the total expenses £111 0s. 6d. leaving a balance in the Treasurer's hands of £1,103 15s. 1d. to the credit of the Parliamentary Committee. The next Congress will convene in Belfast, Ireland, in September, 1893.

Report of the Parliamentary Committee.

Ladies and Gentlemen,—It is now exactly a quarter of a century since this work of this Congress began At that time trade unions were regarded as "criminal conspiracies." No legal protection for their property or lands could be obtained, and their members were invariably looked upon with suspicion and dislike It was under circumstances such as these that this institution was formed for the purpose of securing complete freedom of combination and other political reforms in the interest of the industrial classes. How far the Congress has succeeded in this direction may be inferred from the great changes made in the labor laws and the conditions of labor generally since the Congress was last held in Glasgow in 1875. The electoral campaign from which the country has just emerged affords much striking evidence of the importance and value of organized labor.

After the question of Home Rule for Ireland, the necessity for social and industrial reforms was made the dominating feature in the controversy between the opposing parties. We regret, however, that in certain constituencies, even where workmen hold the balance of political power, candidates of great experience, ability and life-long devotion to the cause of labor, were unable to secure sufficient support to return them to Parliament. We have no desire to censure those who are responsible for this state of things; we only desire to point out that, so far as the interests of labor are concerned in the present Parliament, the addition of several other labor representatives to the fifteen already elected —as there might easily have been—would have been of the greatest possible importance.

Work of the Session.

As soon as the last Parliamentary session was opened it became evidence that the mind of the House was more interested in attempts to forecast the result of a general election than it was in the necessity for pressing forward useful and progressive legislation. Some progress, however, has been made during the session and the following measures relating to certain phases of the labor question have received the royal assent, viz.: "An Act to facilitate the provision of Allotments for the Laboring Classes of Scotland," likewise a measure introduced by a representative of one of the divisions of the city of Glasgow (Mr. Provand) relating to the hours of young persons employed in shops. Mr. George Howell also succeeded in carrying a measure which, we trust, will afford greater protection to a most

deserving class who "go down to the sea in ships," and whose labors are often performed in the midst of great dangers. The object of this measure is to extend the powers of the Board of Trade so that they may prevent overladen vessels from proceeding to sea in an unsafe condition. This Act also provides that the water and provisions supplied to the crew—often scanty and unwholesome—shall be properly inspected by officers appointed by the Board of Trade. It was only by attending in his place at times long after midnight that Mr. Howell was able to get this measure through the House of Commons. The thanks of the Congress is due to those gentlemen for the interest which they have taken in these important measures.

Employers' Liability Act.

The late Government announced their intention again this year of attempting to make progress with this measure. Nothing further, however, was done beyond referring to it in the Queen's Speech as a subject on which legislation was necessary. Their bill was not even printed, although the Home Secretary declared, in reply to Mr. Broadhurst, at the opening of the session, that he would "deeply regret if the Parliament came to an end without him having an opportunity of taking the judgment of the House upon it." In winding up the business of the session and of the Parliament, the late leader of the House never once referred to this subject—not even for the purpose of expressing regret that the Government had been unable to fulfil their pledge with regard to it. Your committee also regret that no opportunity has been afforded during the session to consider the bill introduced at their request by Mr. Burt, and which sets forth what we consider to be the proper lines upon which any amendments of this Act ought to proceed. We trust, however, that the present Government will take an early opportunity of dealing with this question, as it is one which can be dealt with better and more quickly by them than it is possibe for a private member to do.

Limitation of Hours.

At the commencement of the session Mr. David Randell gave notice – at the request of your committee—of his intention to introduce a bill for the purpose of limiting the hours of labor in all trades to eight per day or a maximum of forty-eight hours per week. Mr. R. Cuninghame Graham also introduced a similar bill. Neither of these gentlemen obtained a favorable place in the ballot, and consequently no opportunity was afforded to discuss this question. Both bills were drawn in accordance with the resolution of last Congress and gave the right of exemption to a majority of members in any trade who should declare by a ballot vote their objection to come under such an arrangement.

Miners' Eight Hours.

Your committee corresponded with Mr. Abrahams, who had charge of the bill last year, asking if it was his intention to re-introduce the measure this session. He replied that such was his intention, and the committee then asked in what way they could render him assistance. Mr. R. Leake, however, secured the most favorable position in the ballot, thus taking charge of the bill, and obtained for it a first place on March 23rd. After a debate which lasted scarcely five hours, and in which only ten members took part, the division was taken with with the following result: for the second reading, 160; against, 272—majority against, 112. Your committee desire to point out in reference to this measure that it differed from the bills of Mr. Randell and Mr. Graham in two important particulars. In the bills which dealt with the general question the time limit was fixed at "eight hours' work," and the exemption was also provided where a majority of members in any trade or occupation were hostile to such an arrangement. Neither of those provisions were contained in the bill introduced by Mr. Leake. The time limit as defined by this bill was eight hours from bank to bank, and no right of exemption was proposed for any proportion whatever of those whom the provisions of the bill would affect. These facts to some extent account for the majority by which the second reading of the bill was defeated.

The Law of Conspiracy.

Mr. Robertson again called attention to the unsatisfactory state of the law on this subject, and moved the following resolution: "That the common law doctrine of conspiracy by which persons are made punishable for combining to do acts which in themselves are not criminal, is unjust in its operation and ought to be amended." In a most able speech Mr. Robertson called attention to the vagueness of the law, and quoted authorities to show that conspiracy might be held to mean "a combination to do almost anything which the judges regard as a moral wrong, or politically or socially dangerous." No stronger proof of the unsatisfactory state of the law on this subject could have been given than that of the Glasgow case cited by Mr. Robertson in which two men last year were convicted of a criminal conspiracy "to deprive a man of the means of earning his livelihood as a dock laborer and using threats that if he were retained in his employment they would withdraw from their employment." Those two men were convicted and punished for a common law conspiracy, while in a precisely similar case under a charge of "intimidation" the judgment given by the Recorder of Plymouth was held by a superior court to have been entirely wrong. The motion was seconded by Mr. Burt, who contended that it was necessary to clearly define what was meant by "intimidation," especially as experience had shown that those who were entrusted with the administration of the law were not always correct in their rendering of the same. It will be remembered that last year this question was brought before the House of Commons in the provisions of a bill, which was rejected on its second reading.

This year, as we have before pointed out, the subject was dealt with in a motion and defeated by an amendment which declared, "That this House declines to pledge itself to any alteration of the law of conspiracy until it has had an opportunity of considering the proposed amendments in a definite form and embodied in a bill, so that their effect upon the existing law can be adequately considered in connection with all interests affected." Mr. Robertson first proposed to deal with this question by the introduction of a bill, which was rejected; he then proceeded to deal with it by way of resolution, which was also defeated. On the latter occasion the principal argument of the opponents of reform was that the question was too important to be dealt with in a resolution, and on a former occasion they voted against it when brought forward in the provisions of a bill. It was clear, therefore, that the late Government were opposed to any change whatever of the law on this subject, and we can only hope that the present Government will look with more favor upon attempts to amend the law in this direction.

Payment of Members.

The question of paying respresentatives for their services in Parliament was debated in the House of Commons on March 25th on a motion moved by your secretary in the following terms: "That as the principle of gratuitous public service upon which representation in the House is at present based limits the freedom of constituencies in the selection of their representatives, this House is of opinion that a reasonable allowance should be granted to members for their services in Parliament." The debate came on at an evening sitting, and the division was taken in a house of 393 members (including tellers), voting as follows:—For, 164; against, 229—majority, 65. On a previous occasion, in a house of 331 members (including tellers), the voting was—for, 137; against, 194—majority, 57. So that with 64 more members present the majority was only increased by eight votes. Considering that the debate was on a Friday night, and at a time when many members leave town for the purpose of spending the week-end at home with their families, and that 57 Irish members, who usually vote in favor of the motion, were also absent from the division, the result was highly satisfactory, and indicates a steady growth of public opinion in favor of the measure.

Railway Servants' Hours.

The Select Committee appointed at the commencement of the session of 1891 to inquire "whether, and if so in what way, the hours worked by railway servants should be restricted by legislation," finished their labors and presented their report to Parliament

on the 3rd of June last. The committee state that, as a rule, excessive hours appear most frequent on lines with a heavy goods or mineral traffic. There are, however, important differences between the companies which do not arise from any cause of this kind. They state that sometimes long hours are obviously due to mismanagement, as in the case of the Cambrian, the Waterford and Central Ireland, and the Midland and South-western Junction Railways. The committee likewise state that "excessive hours sometimes occur from congestion of traffic which ought to have been foreseen and provided for by additional accommodation and additional staff, as on the North British and the Lancashire and Yorkshire." The report states that no general charge of systematic overwork could be maintained, but proceeds to call attention to the fact that there are still too many cases in which excessive hours are habitually worked without adequate reason, and where no sufficient effort has been made by the companies to deal earnestly and thoroughly with the matter.

After referring to suggestions made by the various witnesses for shortening the hours the committee are unable to recommend the adoption of any of these suggestions. In their opinion the object to be arrived at is to compel any railway company overworking its servants to abstain from doing so, and if the present power of the Board of Trade is insufficient to induce any railway company to comply with its request, Parliament should then empower the Board to enforce a satisfactory schedule of booked time, under a penalty of a fine of £20 per pay for every day during which they refused or neglected to comply with such an order, or evaded it by making an unreasonable difference between booked and actual time or otherwise.

A special report has also been made by this committee dealing with certain cases where it was alleged that witnesses had suffered in consequence of the evidence they had given. In one instance, namely, the case of John Hood, a station master in the employment of the Cambrian Railway Company, the charge was proved to the satisfaction of the committee, and the directors of the company were called to the bar of the House of Commons and censured by the Speaker in accordance with a resolution of the House. It was felt, however, by many members on both sides of the House, that Mr. Hood was entitled to some compensation for the loss of his employment, and as Parliament would not or could not provide such compensation, an appeal signed by all the labor members was issued, and a sum of over £200 was raised on his behalf, which was duly presented to him by Mr. Thos. Burt on behalf of the subscribers.

Increase of Inspectors.

Your Committee waited upon the Home Secretary and the Lord Advocate for Scotland and urged upon them the necessity of increasing the present staff of inspectors for mines, factories and railways. We urged also the appointment of at least one female inspector for those industries in which female labor is so largely employed. We asserted that the present staff of inspectors were totally inadequate for the efficient discharge of the duties they are expected to perform, and as an instance we referred to the fact that thirty-six inspectors were expected to attend to 4,628 mines in the United Kingdom, employing above and below ground no less than 707,411 persons.

Replying to our representations, the Home Secretary said that the system of inspection we apparently desired was a system of "supervision and control by Government officials." In that case it would require not 80 or 100, but 1,000 additional inspectors, if the Government undertook such a task. This statement, we need hardly point out to you, completely misrepresented the grounds upon which we based our request, and revealed an evident want of sympathy with the main object of our interview. A month later, however, in reply to your secretary, Mr. Matthews stated that in order to give full effect to the Factory and Workshops Act of last year, and especially as to its bearing on textile trades, the Government had decided to appoint an inspector to deal with technical matters arising under the Act, and in reply to a further question he stated that he had endeavored to find for the appointment a fully qualified person actually engaged in the trade.

We have learned with satisfaction that such a person has been found in one of the members of your committee, Mr. T. Birtwistle, a gentleman in every sense qualified for the duties of his office.

With regard to the appointment of a female inspector, the Home Secretary promised your committee to make enquiries for the purpose of ascertaining the distribution and number of workshops where women work alone, or in such numbers as to provide sufficient work to justify the Government in making such an appointment. Whether such an inquiry has yet been made, and if so with what result, your committee at present are unable to state.

Guardian and Vestrymen Qualifications.

Your committee waited upon the late President of the Local Government Board (Mr. Ritchie) for the purpose of calling his attention to the necessity for legislation to abolish the property qualification at present required from candidates who desire to become vestrymen or poor-law guardians. The present unsatisfactory state of the law is such that in some districts the qualification is as low as £10, while in others it is as high as £40; even in the lowest case cited it was pointed out to him that workmen, otherwise qualified by intelligence and business capacity, were prevented from serving the committees on these boards. In reply Mr. Ritchie stated he was not prepared to go so far as your committee wished, but he would abolish the office of vestryman in his District Councils Bill; he would further advise, in the case of guardians, that the qualification be reduced.

Accidental Deaths.

It has long been urged by the workers in Scotland that, in cases of accident involving loss of life, public inquiries should be held in every case into the cause of the accident. In the coroner's court, in England, such inquiries are usually conducted in open court; in the Sheriff's court in Scotland, such inquiries have usually been closed to the public. It is now enacted that "where a death has occurred by accident in any mine, factory, or workshop, a public inquiry in open court shall be held by the sheriff upon the petition of any party interested . . . . . and at such inquiry any relative of any person whose death has been caused by the accident . . . or any person appointed by the order in writing of the majority of the workpeople employed in the said mine, factory or workshop, shall be at liberty to attend and examine any witness, either in person or by his counsel, solicitor, or agent, subject nevertheless to the order of the sheriff." The law of Scotland is assimilated to the law of England in all trades and industries governed by the provisions of the Mines Act, 1887, and the Factory and Workshops Act, 1891.

Enginemen's Qualifications.

Your secretary again gave notice of his intention to proceed with the bill for the purpose of providing that persons in charge of steam engines and boilers should possess a certificate of competency. We regret, however that he was unable to secure a favorable opportunity to do so, and the Bill had again to be dropped at the end of the session.

Your committee accompanied the President and Secretary of the National Federation of Enginemen's Associations as a deputation to the late President of the Board of Trade (Sir M. H. Beach) for the purpose of urging the importance of this question and the necessity for greater precautions in the interest of public safety. Sir Michael, as is usual with him, received the deputation with great courtesy, and in reply, while admitting that recent returns showed a slight increase in the number of fatal accidents arising from boiler explosions, due to negligence on the part of those in attendance, on the whole he did not consider that a case had been made out for further legislation, especially with regard to railways and boilers used in agriculture and small manufactures. The case of colliery enginemen, he thought, was somewhat different, but that trade comes under the care of the Home Office, and not under the office of the Board of Trade.

Bills Introduced.

Measures were introduced during the session for the purpose of dealing with the following, amongst other industrial questions, viz.: Coal Mines Regulation Act, Department of Labor, Mining Easements, Merchant Shipping Act, Old Age Pensions, Pauper Labor Disqualification, Plumbers' Registration, and a Bill for the purpose of exempting the funds of trades unions from liability to pay income tax when provident benefits are paid to their members. With the exception of the Plumbers' Registration Bill, none of the aforesaid measures were able to obtain a second reading debate.

International Correspondence.

The resolution which appeared on last year's agenda relating to this question was not reached in time to be considered by the Congress and was, therefore, referred with several others to your committee for consideration. We afterwards received a communication from the Secretary of the "Preliminary Committee" appointed by the British delegates who attended the Brussels Congress in 1891, who were desirous that we should co-operate with them in accordance with a resolution of that Congress in the appointment of an international correspondence secretary. Seeing, however that this Congress was not officially represented at Brussels, your committee deemed it necessary to refer the subject again to you, so that any steps taken in this direction might receive your full concurrence and approval. That some official channel of communication between the workmen of this and other countries would prove, at times, a great advantage, no one will deny, but as the duties to be performed in this direction would also involve considerable labor and expense, it was thought that the responsibility of such a course should rest upon the judgment of the Congress, and not with the members of the Parliamentary Committee. We trust, therefore, that you may have an opportunity before this Congress concludes its labors to express your judgment on this question.

The World's Fair.

It will be remembered that Mr. Mills, (Chicago chairman of the general committee appointed to arrange for several labor congress to be held in Chicago next year), attended the Congress at Newcastle for the purpose of inviting you to send representatives to these Congresses. Since then your committee have received a most cordial and pressing invitation from the President of American Federation of Labor, urging them to take part in these proceedings. Your committee, while gratefully acknowledging the kindness of the American workers, could not promise to do more than bring the question before you at this Congress. It will be for you, therefore, to say whether or not you are prepared to incur the expense of sending delegates to take part in these labor conventions next year.

Standing Orders.

The proposed Standing Orders, a copy of which, we trust, has already been supplied to each delegate, have been prepared, and the order to some extent re-arranged with great care on the part of your committee, and we trust that our suggested alterations may meet with your general approval. Several important changes, which experience has proved to be necessary, are suggested in order that the constitution by which the Congress is governed may prove an efficient instrument for the work which it has to perform. That the conclusions arrived at by the Congress may more accurately represent the opinions of the majority of organized workers, and thereby exercise greater influence on the public mind, we have suggested that all the proposals to be considered by the Congress shall be forwarded to the Secretary of the Parliamentary Committee at least six weeks previous to the meeting of Congress, who shall then forward copies to the official correspondents of recognized trade unions and trade councils not less than thirty days before the meeting of Congress. This alteration, in our opinion, is greatly needed, and ought to be strictly enforced. The Parliamentary Committee are often instructed to use every means at their command for the purpose of giving legislative sanction to proposals adopted by the

Congress but which have never been considered by the trades. Consequently in succeeding congresses difficulties and disappointments are experienced which ought not to have occurred and which might have been prevented by more ample and general consideration.

Your committee are strongly of opinion that before the members of the various trades proceed to instruct their delegates they should have greater opportunity for considering the nature and probable effects of the many important proposals which from time to time occupy the attention of the Congress. If this course be adopted the work of the Congress may then be expected to exercise its proper influence on the public mind and secure for it public sympathy and support, elements most essential to success.

Trade Union Wages and Sub-Contractors.

During the year efforts have been made by your committee to secure due observance of the resolution passed by the House of Commons relating to trade union wages and sub-letting in Government contracts.

General Remarks.

The Labor Commission appointed last year has been strengthened by the addition of four lady commissioners, for the purpose of inquiring more carefully into the conditions under which female labor is generally employed. The labors of the Commission are continued with great perseverance and most careful research. In the minutes of evidence just issued by the various "groups" will be found much important information by those who are anxious to study the labor problem in its various phases: while the excellent "digest" carefully prepared and compiled by the joint secretaries, Messrs. Drage and Burnett, will prove of immense importance to those who desire to arrive at the chief points in the evidence as briefly as possible.

We here take the opportunity of expressing our satisfaction that in the new Government labor has again been recognized in the person of Mr. T. Burt, the president of the last Congress, he having been appointed Parliamentary Secretary to the Board of Trade.

During the year trade, in many directions, has shown a decided tendency to decline, and as is usually the case in periods of transition many unhappy disputes have arisen between employers and their workpeople on questions of wage and other conditions of labor. The extent to which the principle of division of labor has been applied in production often renders a variety of trades totally dependent upon the steady continuance of each other. When, therefore, a strike or lockout takes place in any one branch of that industry, workmen employed in cognate trades are often made to suffer through no action of their own. This, doubtless, is the reason why so many witnesses before the Labor Commission have declared themselves favorable to compulsory arbitration in all cases of dispute. Your committee offer no opinion as to the practicability of such a proposal; we would, however, strongly advise that every method of conciliation should be suggested before having recourse to the arbitrament of force in the settlement of labor disputes.

In connection with trade depression many eminent authorities are of opinion that currency troubles have much to do with it, and during the year your Committee have expressed themselves in favor of the Government taking part in a conference on the subject, such conference having for its object to ascertain if any relief can be obtained in this direction.

With the exception of one or two resolutions already referred to, your Committee consider that the unfinished business of last Congress is too important to be dealt with otherwise than by a vote of the Congress, and therefore refer them to you as the proper tribunal to deal with such questions.

In conclusion, we desire to express the hope that the labors of this Congress, while tending, as we believe they will, to strengthen and consolidate the organization of labor, may likewise tend to increase and confirm the confidence which this Labor Parliament has already won from the general public, and thereby secure a wider sympathy and more general support for those measures of social and industrial reform which this Congress seeks to promote.

The Parliamentary Committee.

After mature discussion and consideration the foregoing report was adopted.

PRESIDENT'S ADDRESS.

President Hodge prefaced his able and exhaustive address, in taking the chair after his election, in the following language: "The labor problem at the present time receives more attention at the hands not only of politicians but of philanthropists, the public and the press than ever it has previously, and that attention generally of a favorable character. To trade unionists this is a healthy and encouraging sign, evidencing the fact that our efforts for the emancipation of the toiling masses and the success which has attended those efforts, have at last awakened the public conscience to the fact that not only does a well-regulated trade union confer a benefit on the individual as an individual but upon the community in general." Following this, in retrospect of the past, he also said:

"This Congress marks another milestone in the march of progress. It is our semi-jubilee meeting. It may not be inappropriate to contrast the circumstances under which we now meet as compared with the initial Congress held in Manchester twenty-five years ago. At that time trade unions were looked upon with scant favor. In spite of the open and covert hatred of its detractors and the hostility of the press, trade unions have by the moderation of their conduct, by the benefits conferred upon their members, and the social improvements effected as a consequence of those efforts, obtained a footing and a usefulness in the body-politic that their then opponents now freely admit. I do not forget we have still a few critics left who can discern nothing good in the trade union movement. Year by year our Congress has become more and more a valuable medium for the discussion of measures affecting the weal of the unions, as well as measures for the improvement of the social and industrial condition of their members. The statute book of the realm contains upwards of fifty Acts directly due to trade union effort, the Congress having been a valuable medium for the discussion of these measures, and in the education of public opinion. Met as we are to consider what further measures are necessary for the advancement of the cause and the amelioration of the conditions of labor, it would be well for us to review the past, taking special note of our errors, endeavoring to find out the causes attached to our failures, so that in the future we may avoid them. Let us reform, embellish and beautify our ideals; be strengthened and encouraged by the successes of the past to be steadfast and persevering in seizing and utilizing every opportunity of furthering our ideas and our principles, and hastening on the time when the workers may all join in saying—'there is nothing better for a man than that he should eat and drink and make his soul enjoy good in his labor.' Unfortunately, too many of the toilers, men as well as women, fail to get either enough to eat or drink, and have no enjoyment of life. Despite the fact that year by year our country grows richer and richer, many find life a grievous and intolerable burden, while others find it difficult to live at all. No doubt much of this is due to our bad social customs, and is directly traceable to the old feudal system, with the reverence, the homage, and the servility which had to be paid to the 'lords of the soil' by the toilers. This servility to wealth and power dies hard. The spread of education, the educating and new power of the press aptly described as the workingman's library, and the reception of political power, have infused new ideas, new principles and new aspirations into the heads and hearts of the workers. No longer are they content to be the mere hewers of wood and drawers of water; a new, a laudable desire has taken possession—that desire being 'to make his soul enjoy the fruit of his labor.' How labor is to be emancipated, the status of the worker still further raised, is the problem we have to face. Much has already been done. The ground gained will never be lost. Our progress may have been slow; it has been sure. Sudden resolutions lead to excesses. This we do not desire. We are anxious to accelerate our rate of progress by our unions striking out in new directions—by an organizing crusade among the unorganized—by the discreet use of political power—by the advocacy and advancement of social and labor questions on all local or municipal boards—by our trade unions practising many of the doctrines they preach—and by the development of co-operation. Take an instance in this latter respect. In this vicinity a certain trade made a claim for an advance of wages upon an employer who paid less than the standard rate of wages ruling in that trade. He refused to concede the demand; a strike resulted. The other employers came to the rescue of their colleague by locking out their men. As a result of the lock-

out the trade union has made a start on its own account on co-operative principles, and so far with marked success. The success which has attended this trade will cause other trades to think if they have succeeded why should we not. Success will cause emulation —the ultimate results no one can foretell." He also referred to the twin curses of poverty and drink, holding that the latter is much too frequently the cause of the former; to social education, unnecessary Sunday work, industrial warfare, labor organization, women's trade unions, municipal socialism, social dangers and reforms, labor a political force, taxes on capital and labor, an eight hour day, land reform, foreign immigration, and old age pensions.

During the six days' sessions of the Congress the questions mainly dealt with were: Registrars' Charges, Royalty Rents and Wayleaves, Decimal Weights, Measures and Coinage, Protection in Factories, Sweating in the Tailoring Trade, Registration Reforms, Co-operation, Inspection of Fishing Boats, Government Sub-contracting, Government Contracts, Enginemen's Hours of Labor, Labor Representation in Parliament, Amendment of the Employers' Liability Act, respecting the Empanelling of Juries, Shipping Legislation, Qualification of Poor Law Guardians, Lighthermen's Certificates, Trade Union Label "Rat Shop" Newspapers, Enginemen's Qualifications, International Reduction of Hours of Labor, Compulsory Registration and Examination of Steam Boilers, the appointment of additional Factory Inspectors, Boards of Conciliation, Night Work in the Bakery Trade, Eight Hours Day for Bakers, Miners' Eight Hours Bill, Proposed Labor Exchange, Restriction of Foreign Labor, Conspiracy Act, Chicago Labor Convention, respecting Relations between Skilled and Unskilled Labor, the Hours of Shop Assistants, Foreign Pauper Labor, Workmen as Magistrates, the Municipalization of Tramways, Nationalization of Minerals and Metals, Nationalizing of the Mining Industry, Old Age Pensions, the Truck Act, the Dangers of Domestic Workshops, Artisans' Dwellings, and many others of scarcely less importance to work people in Great Britain.

After the close of the Congress an imposing demonstration and street parade in honor of the visiting delegates took place, and was participated in by the Trades and Labor Council (incorporated in 1858) and the several labor organizations of the city of Glasgow. Over 15,000 persons marched in the parade. A poetical effusion extensively circulated *en route* of procession contained the following verse:

"To labor a third of existence we'll give,
"That we and our dear ones may honestly live;
"And stern and determined, each nerve we shall strain,
"Eight hours we demand, and eight hours we shall gain."

INTERNATIONAL LABOR CONGRESS.

Prominence has been given to the international movement among the miners, because among the workers of that industry the nearest approach seems to have been made to anything like a mutual understanding, and because their conferences have been more frequent than in the case of other trades, or of the general body of international labor. The report of 1889 brought down the record of general international congresses to the one held in Paris in that year.

The Paris Congress decided that the next international gathering of that kind should be held in Brussels in 1891, and in accordance with this arrangement the Brussels Congress met at the "Maison du Peuple," in the month of August. A few trade unions were represented, but the Congress was for the most part socialistic, among those present being a considerable number of English and Continental Socialists, not directly connected with the labor movement, nor representing any trade union. In all 363 delegates were reported present, and every country in Europe, except Russia and Portugal, was said to be represented. Several delegates representing anarchial or revolutionary societies were excluded from the Congress. During the sittings of the Congress two delegates were arrested by the police, one being sent out of the country, but the other was allowed to remain until the Congress terminated.

The first two days and the greater part of the third day were taken up with formal business and the making of reports. After much discussing and the moving of many amendments, all of which were referred to a committee, the first proposition was submitted as follows and was carried unanimously:

This Congress, recognizing the existence of a class struggle, and convinced that as long as class rule prevails the emancipation of the working classes will be impossible, declares that the laws enacted and the decrees issued in various countries since the Paris International Congress, held in 1889, do not in any respect meet the aspirations of the workers. That although the Berlin Conference, as admitted by those who themselves initiated it, met under the pressure exerted by the International Labor Congress, and may therefore be regarded as an important concession to public opinion, the results have demonstrated that existing governments do not wish to effect necessary reforms, and that, on the other hand, the resolutions of the Berlin Conference have been used as a pretext, by certain manufacturing countries, to arrest the development of labor protective legislation, by invoking the decisions of the Berlin Conference, and pointing to the defects in the legislation of competing countries. Moreover, this Congress affirms that in cases in which legislation is not defective, its application is allowed to remain inoperative. For these reasons, this Congress urges upon the workers of all countries to agitate for the realization of the programme laid down by the Paris Congress, if only to make it clear to the workers that the governing and exploiting classes are hostile to legislation effectively protecting the interests of labor. Whereas it is necessary to give to the international labor movement a common impulse, especially in its relation to working class legislation, therefore be it resolved by this Congress:

1. To organize in every country a permanent commission of inquiry concerning the conditions of labor in its relation to working class legislation.

2. To collect, collate and exchange all necessary information with a view to the development and unification of all the said legislation.

3. This Congress recommends the wage-workers of the whole world to unite their efforts against the domination of capital, and, wherever they enjoy political rights, to exercise them with the object of gaining their emancipation from wagedom.

The Congress concurred in a resolution condemning the anti Semitic and Philo-Semitic agitation as a device of the capitalistic class, and of reactionary governments to divert the Socialist movement from its course, and to sow division among the workers, and affirming that the only way to achieve the emancipation of the Jewish working classes was to effect the analgamation of the socialistic and labor parties.

The British delegates submitted a resolution affirming, substantially, that it is the duty of the working classes to organize strikes and boycotts, these, at present, being the only weapons which they possess for carrying on war against capital. This war should be maintained by the various groups of workers with vigor, but, nevertheless, recourse should be had to arbitration whenever this is practicable without compromising the dignity of labor. A central committee should be established in every country where it is possible for the purpose of obtaining, centralizing and diffusing information concerning labor matters. All wage-earners should become members of trade unions, and the employment of the workers should be regulated only by their own unions, and by labor exchanges of which they have control. Contracts for public work should be given to trade unions only, and if a union refused to undertake the work, then it should be performed only by firms who employed none but trade unionists. The resolution also declared that the right of combination should be guaranteed by law, and that severe penalties should be imposed on anyone making an attack upon that right. Before this resolution was adopted, however, and at the instance of the delegates of other nationalities, the sentence declaring that government work should be given only to trade unions was struck out.

A resolution was agreed to declaring that, as militarism was due to the capitalist system, any attempts to abolish it must be useless if they did not strike at the root of the evil, and appealing to the whole world to protest with unceasing energy against incitements to war and alliances which led up to them. The representatives from Holland refrained from voting on this resolution.

A unanimous vote condemned the systems of piece-work and sub-contracting, while only three voted against the following resolution:

This Congress invites the socialistic parties and labor parties of all countries to affirm energetically in their programmes the complete equality of the two sexes, and to demand the concession to women of the same political and civil rights as men, and the repeal of all laws placing women outside public rights.

The session lasted for seven days. After deciding that the next International Congress should be held in Switzerland, in 1893, the Congress broke up.

THIRD ANNUAL REPORT OF THE UNITED STATES COMMISSIONER OF LABOR, 1887.

Strikes and Lockouts.

Analysis of Tables.

The industrial disturbances which have been so frequent in this country since 1877, really establish the period as one of strikes and lockouts. A strike occurs when the employees of an establishment refuse to work unless the management complies with some demand. A lockout occurs when the management refuses to allow the employees to work unless they will work under some condition dictated by the management. In effect strikes and lockouts are practically the same thing, the disturbances simply originating with one side or the other in the case. . . . . .

The tables in this report, Chapter II., relate entirely to strikes and lockouts occurring in the United States for the six years beginning with January 1, 1881, and ending December 31, 1886. . . . . .

To understand the accuracy and completeness of this investigation the methods under which it has been conducted should be stated.

Early in 1886 a portion of the force of the bureau was employed in examining the files of the leading daily papers, trade magazines and commercial periodicals published in the United States during the years involved in the investigation for the purpose of finding all references to strikes. Duplications were then eliminated, and from the preliminary data thus secured, locating strikes, the agents were supplied with indicative evidence of their existence, not only as to locality and industry but as to the names of parties interested and the establishments concerned. With these preliminary data the members of the force were assigned districts for active canvassing. Besides using the preliminary data, they were instructed to make diligent inquiry in all directions for strikes and lockouts other than those named in their preliminary lists. Labor organizations, manufacturers' associations of various kinds, local newspapers, trade societies, in fact all means were resorted to which gave any prospect whatever of furnishing information relative to the subject of the investigation. In this work the bureau was materially aided by various labor organizations—Knights of Labor, trades unions and others—with the lists of strikes occurring during the years involved in their respective jurisdictions. By these means it is believed the bureau has secured information relating to nearly every strike, if not every strike, which has occurred in the United States during the period covered. If any have escaped its agents and experts they have been of so little account as not to attract the attention either of the press or others. All such processes were utilized simply to learn the locality of each strike. The facts found in the tables, however, and which form the basis of this report, were collected in each locality where a strike or lockout occurred by the agents of the bureau who sought information from each side concerned. The parties instigating a strike were consulted, and where it was ordered by an organization the officers thereof were asked to contribute their information. The management of the establishment in which a strike or lockout occurred was also called upon. If the information given by either side in the controversy agreed with that secured from the other, the agent con-

sidered the facts accurate. If there were discrepancies, or either side refused information, a re-examination was made, and the agent, after considering all the evidence to be gained on either side, reported what the facts seemed to be. It may be, therefore, that participants, or others supposing themselves to be cognizant of the facts relating to a certain strike, will find the details as exhibited in the tables somewhat different from their own recollection. In explanation, it may be stated that the agent weighed the conflicting statements and determined each detail as judicially as possible, making his report not to agree with the testimony of any single individual, but in harmony with the concurrent evidence of the majority, or what seemed the most reliable. The bureau made every effort to secure the truth, and did not leave a controversy until it was fully believed that the truth had been reached.

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Bearing in mind what has been said, a statement regarding the number of strikes in each year may now be made which will exhibit with approximate correctness the relative disturbances in each year and enable the reader to determine with some justness their spread or diminution. These figures, with the exception of the figures for the number of establishments, must not be accepted as absolute for the reasons given.

RELATIVE NUMBER OF STRIKES BY YEARS.

Years.	Strikes.	Establishments.	Average establishments to a strike.	Employees striking and involved.
1881	471	2,928	6.2	129,521
1882	454	2,105	4.6	154,671
1883	478	2,759	5.8	149,763
1884	443	2,367	5.3	147,054
1885	645	2,284	3.5	242,705
1886	1,411	9,861	7.0	499,489
	3,902	22,304	5.7	1,323,203

By this table the average number of establishments to each strike for the six years was 5 7, the highest number being 7 0 establishments to each strike in 1886 and 6.2 in 1881, the lowest average being 3.5 establishments to each strike in 1885. In 1880 (according to a report of Mr. J. D. Weeks, special agent of the tenth census), there were 610 strikes The number of establishments involved was not given, but applying the ratio for the six years under discussion, of establishments to strikes (that is, 5 7) to the number of strikes for 1880, would produce 3,477 establishments for the 610 strikes of that year. In 1887, according to the best information which can be obtained relating to the number of strikes only, there were 853 strikes; and according to the rule just applied for 1880, this means 4,862 establishments in 1887. It is to be regretted that we have not the data for 1878 and 1879, but it is very clear, from the facts just stated, that the number of establishments in the United States affected by strikes was much larger in 1880 than in any year since, except 1886 and 1887. Commencing in 1880 with 3,477 the number dropped in 1881 to 2,928; to a still lower point in 1882, viz, 2,105; while in 1883 the number rose again quite near to that of 1881, or to 2,759. A rapid fall again occurred in 1884, the number being 2,367, while in 1885 the number of establishments subjected to strikes was smaller than in any previous year named, except 1882, it being for 1885, 2,284. In 1886 the number of establishments rose to 9,861, while in 1887 it has dropped back to less than 5,000 In 1887 the number for the first six months was, in round numbers, 3,000, leaving 1,862 establishments subjected to strikes during the latter half of the present year. It thus appears that the turning point was reached in the year 1886, and that it can be emphatically stated that strikes are now on the decline. . . . . .

With this statement for the number of strikes and establishments involved for the years 1880 to 1887, inclusive, no further reference will be made in this chapter to the years 1880 and 1887, the analysis being confined entirely to the years from 1881 to 1886, inclusive, for which period the investigation was instituted, and the establishment will be used as the unit instead of the number of strikes.

There were 22,304 establishments involved in strikes during the whole period, 13 13 per cent. of which had strikes in 1881, 9.44 per cent. in 1882, 12.37 per cent. in 1883, 10.61 per cent. in 1884, 10.24 per cent. in 1885 and 44.21 per cent. in 1886; while of the 2,214 having lockouts during the period 0.41 per cent. were in 1881, 1.90 per cent. in 1882, 5.28 per cent. in 1883, 15.99 per cent. in 1884, 8 26 per cent. in 1885, and 68.16 in 1886. Both for strikes and lockouts the percentage is the highest for the latter year. New York had the largest number of establishments affected, both for strikes and lockouts, there being for the former 9,247, and for the latter 1,528. The building trades furnished 6,075 of the total number of establishments engaged in strikes.

The total number of employees involved in the whole number of strikes for the whole period was 1.323,203. The number of employees originating the strikes was 1,020,156. The number of employees in all establishments before the strikes occurred was 1,660,835, while the number employed in the establishments involved after the strikes occurred was 1,635,047, a loss of 25,788. There were 103,038 new employees engaged after the strikes, and 37,483 were brought from other places than those in which the strikes occurred, showing the per cent. of new employees after strike of the total number of employees before strike to be 6 20, and of employees brought from other places of the number of new employees after strike to be 36.38.

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Of the 22,304 establishments in which strikes occurred, the strikes in 18,342 or 82 24 per cent. of the whole, were ordered by labor organizations, while of the 2,214 establishments in which lockouts occurred, 1,753 or 79 18 per cent. were ordered by combinations of managers. . . . . Strikes are ended in various ways—by the return of the strikers, by the employment of new men, by the yielding of the firm, or by the strike being declared off

So far as gaining the objects for which the strikes or lockouts were instituted is concerned, it is shown by the summaries that for the strikes, out of the whole number of establishments affected, viz., 22,304, success followed in 10,375 establishments, or 46.52 per cent. of the whole; partial success was gained in 3,004, or 13.47 per cent. of the whole, and failure followed in 8,910 establishments, or 39.95 per cent. of the whole number; for 15 establishments, or 0 06 per cent., the strikes were still pending December 31, 1886.

For lockouts, 564 establishments, or 25.47 per cent, of the whole, succeeded in gaining their point; 190, or 8 58 per cent. partially succeeded, and 1,339, or 60.48 per cent. of the whole, failed; for 121 establishments, or 5.47 per cent., the lockouts were still pending December 31, 1886.

Upon an examination of the causes for which strikes were undertaken . . . . , . . . it is found that 17 causes constitute 90.28 per cent. of all the establishments. leaving 297 causes operative in only 9.72 per cent. of the establishments. Even four leading causes are seen to cover 77.16 per cent. of establishments. These facts are brought out clearly in the following exhibit of causes:

Strikes for an increase of wages occurred in 9,439 establishments; of these the strikes in 6,229, or 65.99 per cent. were successful, while in 796, or 8.43 per cent., the strikes were partly successful and in 2,414 establishments, or 25.58 per cent., the strikes for this cause failed.

In 4,344 establishments strikes were resorted to to secure a reduction of the hours of labor, in 1,055, or 24 29 per cent., success was the result; in 966, or 22.24 per cent., the strikes were partly successful, and in 2,323, or 53.47 per cent., the strikers were defeated.

LEADING CAUSES OF STRIKES—NUMBER AND PER CENT. FOR THE UNITED STATES.

Cause or Object.	Establishments.	Per cent.
For increase of wages	9,439	42.32
For reduction of hours	4,344	19.48
Against reduction of wages	1,734	7.77
For increase of wages and reduction of hours	1,692	7.59
For reduction of hours and against being compelled to board with employer	800	3.59
For change of hour for beginning work	360	1.61
For increase of wages and against the contract system	238	1.07
For increase of wages and against the employment of non-union men	215	.96
In sympathy with strike elsewhere	173	.77
For 9 hours' work with 10 hours' pay	172	.77
Against employment of non-union men, foremen, etc	162	.73
For increase of wages and recognition of union	145	.65
For adoption of union, etc., scale of prices	142	.64
Against increase of hours	138	.62
For increase of wages and enforcement of union indenture rules	132	.59
For reduction of hours and wages	126	56
For reinstatement of discharged employees, foremen, etc	124	.56
	20,136	90.28
All other causes (297)	2,168	9.72
Total for the United States	22,304	100.00

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Understanding, then, the difficulties in ascertaining the exact loss of employers and employees as resulting from strikes and lockouts, reference may be had to the summaries, where the information which has been collected is grouped. The loss to the strikers, as given in these tables for the period involved, was $51,814,723. The loss to employees through lockouts for the same period was $8,157,717, or a total wage loss to employees of $59,972,440. This loss occurred for both strikes and lockouts in 24,518 establishments, or an average loss of $2,446 to each establishment, and over $40 to each person involved.

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The assistance given to strikers during the period covered by this investigation, so far as ascertainable, amounted to $3,324,557; to those suffering from lockouts $1,106,038, or a total sum of $4,430,595. This figure is undoubtedly too low, representing only 8.38 per cent. of the wage loss incurred by the employees. Naturally, societies formed for the assistance of strikers and those suffering from lockouts hesitated to report the sums expended by them in aid of strikes, and the sum stated is indicative of the truth, but probably not the whole truth.

The employers' losses through strikes, for the six years, amounted to $30,701,553; the employers' losses through lockouts, to $3,462,261, or a total loss to the establishments involved in both strikes and lockouts of $34,163,814. To some extent this loss as given for employers was an actual, immediate loss; but as to its permanency it was, to some extent, of a more fictitious nature than the loss to employees, for reasons that will readily suggest themselves. No facts could be ascertained and no intelligent estimate formed concerning the losses to individuals indirectly related to establishments in which strikes or lockouts have occurred; in other words, concerning the indirect effect of strikes and lockouts on the commercial interests of the country.

LABOR REPORT OF GREAT BRITAIN FOR 1890.

Strikes and Lockouts.

The report for 1890 of Mr. John Burnett, labor correspondent of the Imperial Board of Trade of Great Britain, addressed to the Assistant Secretary of the Commercial Department of that body, on the strikes and lockouts in the United Kingdom in the year 1890, covering 361 printed pages, is most interesting both in elaboration of statistical detail and in the impartiality of analysis. In his introduction Mr. Burnett says:

"In reporting to you specially on the strikes and other labor conflicts of the year 1890, I think it at the same time desirable to preface the statistical information contained in the various tables presented herein with a few preliminary observations.

"It appears desirable, in the first place, to make some remarks as to the general circumstances of the year in connection with labor movements, and as to the tendency which those may have had to encourage or otherwise affect the development of labor disputes. Secondly, it may be necessary to present in a summarized form the leading points of interest set forth in the detailed tables of the report, adding such remarks as may seem requisite to bring out the more important facts which underlie them. Finally, it would be well to summarize very briefly the chief features of the general labor movement of 1890, in continuation of the method adopted in the report of last year; and also to call attention to any of the legislation of the last session of Parliament which may directly affect labor; making, in effect, this report a continuous record year by year of the events and facts most important from the labor point of view.

"1890 was undoubtedly a most prosperous year for the chief industries of the kingdom. In every department of labor the demand for workers was throughout vigorous and well sustained, especially during the first seven months. The revival of trade which began to show itself in 1887 seems to have reached its culminating point during the latter part of 1889 and the earlier half of 1890, and these two years must for the present be bracketed together as two of the best years ever enjoyed by British labor. It is, in fact, impossible to name a branch of trade of any importance which did not share in the general prosperity. The best proof of this is furnished by the returns made from month to month as to the numbers of their unemployed members by many of the trade unions. Unfortunately the whole of the trade unions do not make such returns, and a large proportion do not pay any unemployed benefit and have therefore no means of knowing how many may be out of work on any given date. The societies mostly making such returns are, however, large societies, and contain within their ranks so considerable a share of the whole number of people employed in the trades they represent that their reports may be taken as giving a tolerably correct indication of the state of employment in their respective industries.

"Again, the larger staple trades of the country are those in which the labor is best organized, and it is therefore from these that the most complete unemployed returns are received, and there is obtained from them a fairly accurate representation of the state of those trades. As to the lesser industries which are almost invariably dependent upon the staple trades, although no actual return of numbers of unemployed may be obtained, it is quite certain that their condition is fairly reflected by the state of the trades upon which they depend. In this way, therefore, although the actual number of members contained in the societies making unemployed returns may be small relatively to the whole mass of labor of the nation, the figures they supply may be taken as illustrating with at least approximate exactness the general condition of the whole labor market of the nation. This at all events is the view taken by the leading trade unions themselves, and it is quite common for them to speak of their monthly reports as barometers showing the state of trade. It thus becomes of interest in reviewing the labor history of the year to observe from this point of view what the state of the labor market has been, and to what extent the indications given by these reports may have influenced the movements causing strikes and other stoppages of labor.

"A very brief tabular statement, based upon the returns of about 20 of the leading trade unions, and representing directly close upon a quarter of a million of workers, will show in little what has been the monthly condition of the labor market. For purposes

of comparison the figures, so far as available, for the four years 1887 to 1890, are given in full, while those for the present year, 1891, are given up to the latest month for which they are obtainable at the date of writing."

STATEMENT SHOWING MONTHLY PERCENTAGES OF UNEMPLOYED MEMBERS OF CERTAIN TRADE UNIONS:

Month.	1887.	1888.	1889.	1890.	1891.
January	9.9	6.8	3.3	1.75	3.05
February	10.3	7.8	3.1	1.44	3.37
March	8.5	7.0	2.8	1.40	2.6
April	7.7	5 7	2 2	1.70	2.85
May	6 8	5.2	2 0	1.96	2.69
June	8.5	4.8	2.0	1.96	2.98
July	8.0	4.6	1.8	1.88	2.86
August	8.5	3 9	1.7	2.28	3.28
September	8.3	4.8	2.5	2.28	4.23
October	7.5	4.4	2.1	2.6	4 48
November	8.6	4.4	1.8	2.6	....
December	8.5	3.1	1.5	2.4	....

"From this short table is obtained a clear record of the course and rate of trade improvement from the commencement of the period of revival in January, 1887, when there were, roughly, one-tenth of all the workers in the kingdom without employment, down to the present time, when there are a little less than one-twentieth out of work. Between those two periods it is at once seen that the labor market has passed from the depth of depression to the height of prosperity, which, in its turn, seems likely to be followed by less favorable conditions. There are visible in 1887 the evidences of slow but persistent recovery, in 1888 the signs of rapid improvement continued right on to the closing month of 1889, when, it would appear, the demand for labor reached its highest point. Again, for the first seven months of 1890 it remains absolutely steady at a high level, but from that point gradually begins to fall away.

"Taking the monthly average of each of these years it will be found that 1890 was really a better year than its predecessor, and that the state of the labor market was, upon the whole, more equitable. 1887 gives an average unemployment of 8.43 per cent; 1888, 5.2 per cent; 1889, 2.23 per cent.; 1890, 2.02 per cent., and the present year, so far as we know it, 3.24 per cent. On some special trades the effects of the transition from bad trade to good have been even more remarkable.....This state of things naturally caused many demands for increased wages, and other improvements in the conditions of labor, the rate of remuneration in many instances, especially when measured by the hour, rising to a point not hitherto attained. The yearly reports of trade unions for the year clearly demonstrate this, and the addresses of their chief officers are widely expressive of satisfaction at the large share of the general prosperity which their unions have been able to obtain for their members."

ELEMENTS OF LOSS OR GAIN TO WORKMEN.

"In deference to some of the trade unions, who complained that the report of last year showed only the losses of strikes, without making any attempt to show or estimate any gains which may have arisen therefrom, an endeavor has this year been made to obtain some statistics throwing light on this point. In the following analysis of the trade union table, the information supplied in this respect is presented in its most general form. The figures as to wages before and after strikes given by the trade unions are largely estimates, and may be taken for what they are worth. At all events they have the merit of presenting, from the trade union point of view, a sort of rough profit and loss account of a certain proportion of the strikes of the year."

Summary of Particulars Extracted from Returns Received from Trade Unions.

	Number of strike returns from which particulars have been extracted.	Number of persons affected.	Amount.		
			£.	s.	d.
Number of persons directly affected	304	185,759			
" " indirectly "		33,050			
Actual weekly wages earned before strike by those—					
Directly affected	252	165,955	221,864	5	3½
Indirectly "		20,775	30,626	1	4
Actual weekly wages earned before strike by those—					
Directly affected	232	159,492	215,985	17	7½
Indirectly "		19,025	28,481	5	4
Actual weekly wages earned after strike by those—					
Directly affected	232	159,492	233,048	14	11¼
Indirectly "		19,025	28,324	8	2
Actual weekly gain in wages to those affected	137	135,483	17,974	8	4¾
Estimated loss of wages during strike	197	176,020	578,895	..	..
" weekly reduction in wages to those affected	7	10,111	1,068	8	3
Number striking or thrown out of work who belong to trade unions	268	156,644	.....	..	..
Total amount expended in support of strike by trade unions	218	68,682	88,809	2	1
Number of strikers going back to work during strike	93	1,817	.....	..	..

"Thus the trade union returns show, that in 304 strikes there were 185,759 persons directly and 33,050 indirectly affected, but as to the proportion of those who were actually members of trade unions there is no ground of exact comparison, as numbers of unionists concerned are only stated for 268 strikes as being 156,644.

"In 252 cases full information is given as to estimated weekly wages before the strikes, and in these instances it is seen that 165,955 persons directly, and 20,775 persons indirectly affected were earning £252,490. Unfortunately, however, for purposes of comparison, the amount of weekly wages after the strikes is not given for the whole of these 252 strikes. The amounts for both before and after the strikes are given in 232 instances, and this number only must be used for arriving at conclusions as to losses or gains of wages by these strikes. These figures refer to wages disputes only, and therefore no account is taken of strikes for any other object; losses or gains by alterations of the hours of labor are dealt with in a later table. In these 232 cases, then, it is found that the weekly wages before the strikes are stated at £244,467. After the strikes the amount is here stated to have been £261,373. There is thus a net gain in weekly wages to the 178,517 persons concerned of £16,906, but as these include seven strikes in which there were reductions of wages, the weekly amount of these for 10,111 persons being £1,068, it appears the actual increase obtained was £17,974.

"As to loss of wages which might have been earned but for the strikes, it has been found possible to calculate it with accuracy in 197 cases, but these include all the larger strikes, and affected 176,020 persons, the estimated loss of wages for whom was £578,895. This is so large a proportion of the 304 cases in which the numbers affected are given by the trade unions, that it is easy to calculate from it what the wage loss would be to all the persons concerned in those 304 strikes, thus: If the loss to 176,020 was £578,895, the loss to 218,809 would be £719,619. Applying the same mode of calculation to the total number of persons known to have been affected by the strikes of the year, the estimated loss of wages which, it is assumed, might have been earned but for those strikes would be, roundly, about £1,292,436.

"So far as gains and losses can be estimated from the foregoing summary it would appear that the gains in wages per week amount to, for 232 strikes in which 178,517 persons were concerned, £17,974 From this amount must be deducted the weekly loss of £1,068 sustained in the six unsuccessful strikes against reduction which would leave a weekly gain of £16,906.

"On the other side, the loss of wages in those same strikes, including the amount paid in their support by the trade unions, has been £675,916. Dividing this by the above-named weekly gains, it is found that the persons engaged in those strikes would in 40 weeks recover the whole of their wages lossed, provided work went on as usual before the strike, and that they retained the advances gained for the whole of that time. These figures deal only with direct gains and losses, and take no account of what may have been indirectly gained by men in other districts or establishments receiving the advances in consequence of any of these strikes, but without having struck themselves.

"In order to follow up the subject of gains and losses, so far as these can be shown by the trade unions, an effort has been made to obtain information as to gains and losses which have been achieved or submitted to by trade unions without strikes, as well as those brought about by strikes. To this end inquiry forms were sent out to all the trade unions, the addresses of which could be found. In all 500 of these forms were sent out, and about 350 were returned, some being well filled in, but others containing but very little information upon the points laid down. The reports of trade unions, so far as they could be obtained, were also utilized for this branch of inquiry, where they were found of service in this direction. This investigation was also entered upon at the request of some of the workmen's organizations, but the result cannot be considered as at all complete, and there can be no doubt that in many hundreds of cases changes in the rates of wages, hours, or other conditions of labor have taken place of which no record is furnished. This is notably so in the case of many of the larger amalgamated societies, which have hundreds of branches, acting independently on wages matters in different parts of the country, and of the wage movements of which no record is kept." . . .

Summary of Particulars Extracted from Returns Received from Employers.

	Number of strikes of which information is obtained, with the number of establishments affected.		Number of establishments reporting, separately, or through Masters' Associations.	Number of persons and amount.
	Strikes.	Establishments.		
Number of persons on strike	463	2,018	1,575	182,357
" " thrown out of work by strike.	173	892	537	48,932
				£. s. d.
Weekly wages earned by those directly affected.	373	1,785	1,427	226,829 14 1
" " " " indirectly " .	122	692	392	34,466 5 7½
Estimated value of fixed capital laid idle by strike	193	1,016	680	32,113,263 0 0
Annual rateable value of property occupied by firms and laid idle	145	728	405	642,062 7 8
Estimated actual outlay by employers in stopping and re-opening works, and in payment of fixed charges, etc., during stoppage	181	853	541	151,343 3 7
Amount paid in resisting strike by employers' organizations	13	221	209	41,779 11 4

"What is obtained from this is that in 463 strikes, affecting 2,018 establishments 182,357 were directly on strike, and that in the case of 892 of those establishments, there were thrown out of work in addition 48,932 workers not directly concerned in the strike.

"In 373 strikes, affecting 1,785 establishments, the weekly loss of wages by workpeople was put down at £226,830 to those directly affected, and £34,466 to those indirectly affected, a total weekly wage loss in those cases of £261,296.

"One hundred and ninety-three (193) strikes laid idle 680 establishments, having a fixed capital of the estimated value of £32,113,263. In the case of 181 strikes, affecting 853 establishments, the outlay of employers in the payment of fixed charges, such as rating taxation, rent, salaries, etc., and in cost of stopping and re-opening the works all of which must be accounted actual dead loss, was £151,343.

"Thirteen (13) strikes, affecting 221 establishments, were fought by employers' associations at a cost to such associations of £41,779."

STATEMENT SHOWING THE CAUSES OR OBJECTS OF STRIKES IN 1890, AND WHETHER SUCCESSFUL OR UNSUCCESSFUL:

Cause and Object.	Total number.	Number unsuccessful.	Number partially successful.	Number successful.	Result not known.
Wages — For advance	426	182	119	92	43
Wages — For advance and reduction in hours	28	11	11	6	....
Wages — For advance and combined with unionism	8	....	5	2	1
Wages — For advance and other concessions	42	15	17	9	1
Wages — Against reduction	83	34	14	30	5
Wages — For introduction and adherence to scales of prices and wages settlements	42	23	4	10	5
Hours — For reduction	23	10	6	5	2
Working arrangements — Against alterations in working arrangements, rules, holidays, meal times, etc	53	15	10	24	4
Working arrangements — For alteration and improvement in	101	37	22	34	8
Working arrangements — Against introduction or for abolition of system of fines, deductions, etc	10	5	4	1	....
Unionism — Objection to working with or employment of non-unionists	59	14	3	34	8
Unionism — Defence of unionist colleagues, rules, customs, etc	36	13	1	15	1
Unionism — Against introduction or for limitation of apprentice, boy and female labor	11	3	....	7	1
Disputes with fellow-workpeople as to demarcation line of work	17	6	6	5	....
Disputes with fellow-workpeople, as to prices, wages, etc	8	....	1	7	....
Defence of or objection to fellow-workpeople (apart from unionism)	35	9	1	23	2
Defence of or objection to officials	13	2	4	5	2
Sympathy with other disputes or strikes	19	4	1	12	2
Cause not known	10	1	1	1	7
Total	1,028	384	230	322	92

The mode of settlement of strikes is one of the details about which information is most easily obtained, and in 90 per cent. of all the strikes of the year the mode of settlement is known. The particulars on this point are shown below:

Mode of Settlement of Strikes.	Number.
Settled by conciliation	527
" " (by mediation)	15
" arbitration	33
" submission of workpeople	173
" hands being replaced	89
" conciliation and submission	28
" " and hands replaced	11
" submission (by mediation)	2
" " and hands replaced	47
" disappearance or withdrawal of cause of dispute without mutual arrangement	11
Total number giving method of settlement	936

SUPERANNUATION, SICK, FUNERAL, OUT-OF-WORK AND DISPUTE OR STRIKE PAYMENTS.

Under the above heading Mr. Burnett continues to say as follows:

"Sick benefit is also slightly less than in 1887 and although it is somewhat difficult to account in a perfectly satisfactory manner for the fact, it is certain that the bills of health of the trade unions are sympathetically affected by the condition of the labor market. A glance at the sick and unemployed columns of a few of the tables of the larger unions will show that this is so. The most obvious explanation of this phenomenon is, that if employment is scarce and irregular, workmen are unable, by reason of lessened incomes, to feed and clothe themselves so well as when a reverse state of things prevails, and that in consequence they more readily fall victims to various forms of disease. If this is so in the case of men who have the out-of-work benefit of their organizations to assist them, the same evil must prevail to a much greater extent among the unorganized labor, which has no support. There are, doubtless, minor causes at work among members of the unions which also tend to bring about this connexion between good trade and good health among the workers, but it is unnecessary to discuss them here. The fact is that in 1887, 66 trade unions which have a sick fund paid out £146,657, while in 1888 the same societies paid only £142,312 on a larger membership, a decrease of £4,345, or nearly 3 per cent.

"Good trade has undoubtedly the effect of retaining aged workmen in employment longer than would otherwise be the case, and thus it to some extent relieves the superannuation benefit of trade societies which pay this form of relief. But in this age of competition, when vigor and strength count for more than experience, the old are rapidly pushed aside, and this one benefit of superannuation goes steadily on increasing its demands almost regardless of improving trade.

"In 1887, 32 unions which have this benefit in operation paid allowances to the extent of £74,491, but in 1888 they were called upon to pay £83,709, which is an increase of 12⅓ per cent upon the figures of the preceding year. It is, of course, chiefly among the older unions that this increase is most marked, and it offers material for careful consideration. It is worthy of note, however, that in a few cases, by means of special superannuation levies or otherwise, steps are being taken to place the funds for this benefit upon a basis more permanent in its character than that at present existing.

"Funeral benefit does not, in an ordinary way, fluctuate much, and does not appear to be to any extent affected by the changes of the labor market. The rate of mortality, however, among workmen, as illustrated by their reports, is sometimes considerably increased when a very depressed state of the labor market coincides with a very severe winter. The difference in the cost of this benefit, as between 1887 and 1888 is but £63, the amounts being £39,371 for the 81 unions which paid this benefit in 1887, and £39,308 for the same societies in 1888.

"It will be seen that while only 32 per cent. of the unions included in this report have a superannuation benefit, 66 per cent. a sick benefit and 70 per cent. an unemployed benefit, 81 per cent. have paid funeral benefits, a fact which testifies strongly to the intense feeling of workmen in respect to the decent interment of themselves and wives.

"Into any analysis of the lesser friendly benefits it is not necessary to enter, as they vary so much, but a few words may be said as to the amounts expended on dispute or strike payments by the societies which have incurred such expenditures. The generally prevailing idea is that this branch of outlay is a much more important one than it really is, and it is desirable, as far as possible, to extract from the accounts of the societies here represented, as much information on this point as can be gathered, in order that a means of comparison with the cost of the other benefits may be furnished. This process of extraction is not always easily accomplished, and doubtless in a few cases some strike outlay may be included among other items. In other instances the amount shown as dispute benefit may be only a supplementary sum paid in addition to ordinary unemployed benefit. In all these cases, however, calculations based on special knowledge have been made which insures a very near approximation to the actual amounts.

"The year 1888 was, as has been observed, one of transition, and thus strikes were numerous, though generally not of long duration.

"A record has been made of 509 strikes and 8 lockouts, which took place in 1888, and in 354 of the former, for which numbers of persons involved are available 118,288 workers were concerned.

"The effect of these industrial disturbances can, of course, be seen from the accounts of some of the societies as here published, but in no case does the amount expended appear unduly large. The following statement will show amounts in detail :

Name of Society.	Number of members.	Amounts expended.	Amounts per head.
		£	s. d.
Operative Bricklayers' Society	6,937	62	0 2
United Operative Bricklayers' Society	1,238	3	0 0½
Amalgamated Society of Carpenters and Joiners	25,050	4,499	3 7
Associated Carpenters and Joiners	3,833	453	2 8
House Decorators and Painters	1,100	....	0 1¾
Operative Plumbers' Association	3,921	461	2 9½
Operative Plasterers' Association	1,470	1	0 0¼
Operative Stone Masons' Society	10,161	170	0 4
Alliance Cabinet Makers' Association	1,402	114	1 7½
Amalgamated Union of Cabinet Makers	1,109	110	1 11¾
National Union Boot and Shoe Riveters and Finishers	11,410	3,221*	5 7¾
Society of Felt Hat Makers	2,027	178†	1 10
Amalgamated Society of Tailors	14,214	428	0 7¼
Scottish Operative Tailors	2,500	77	0 7¼
Coach Iron Workers' Association	36	10	5 6½
Operative Brass Cock Finishers	47	18	7 8
Associated Blacksmiths' Society	1,628	87	1 0¾
Boiler Makers and Iron Shipbuilders' Society	26,545	4,533	3 4¼
United Society of Holders Up	324	76	4 8¼
Journeymen Brassfounders' Association	1,688	194	2 3½
Amalgamated Society of Engineers	53,740	6,000‡	2 2¾
Steam Engine Makers' Society	5,165	340‡	1 3¾
Iron Founders' Society	12,202	131	0 2½
Glass Bottle Makers' Society	1,536	14	0 2
Ayrshire Miners' Union	500	135	5 4¾
Sterlingshire, Forth and Clyde Valley Miners	1,200	15	0 3
Hindley Miners' Society	380	66	3 5¾
Northumberland Miners' Association	12,456	3,544§	5 8¼
West Bromwich, etc., Miners	976	761	15 7
Woodlesford and Methley Miners	14	9	12 8½
London Society of Compositors	7,400	459	1 2¾
Typographical Association	7,741	752	1 11¼
Edinburgh Typographical Society	720	23	0 7½
Amalgamated Society of Railway Servants	12,050	901	1 5¾
Oldham Card and Blowing Room Operatives' Association	6,281	910	2 10¾
Amalgamated Association of Operative Cotton Spinners	16,910	1,720	2 0½
West Riding of Yorkshire Power Loom Weavers	700	70	2 0
Wheelwrights and Blacksmiths' Society	821	14	0 4
Lancashire Miners' Federation	17,295	2,153	.....
Totals and average per head	274,727	32,729	2 4½

"Thus 39 societies, with a total membership of 274,727, have, in a year when strikes were numerous, expended an aggregate of £32,729 on dispute pay, which is a general average of only 2s. 4½d. per member. This is a very small proportion, indeed, of the total expenditure of these societies, and the above table may do something to correct erroneous ideas as to the channels into which trade union funds generally flow."

* This amount includes expenses of investigations, compensation and arbitrations.

† This includes payments to members "victimized" after disputes.

‡ Approximate only.

§ £1,804 of this amount was a charge remaining over from the strike of 1887.

STRIKES—GENERAL SUMMARY.

In order that a comprehensive idea of the strike statistics of 1890 may be conveyed in as brief a space as possible, it is desirable to group together, generally, all the chief facts brought to light by the inquiry. This will be best done by stating them in a summarized form in such a way as to practically give a bird's-eye view of the principal results demonstrated in detail by the tables of appendices to this report, and by the more extended observations that have gone before.

1890 was a year of good trade and strikes were numerous. Under the method of collection of particulars adopted by the Board of Trade, 1,028 strikes were recorded. A large number of these were general strikes, and the total number of business establishments from which the work people turned out was at least 4,382 In gathering details as to these disputes 1,240 forms of inquiry were sent to employers of labor and 630 to organizations of workmen. Replies were made by employers in 801 cases and by workmen's organizations 349.

An analysis of these disputes by trades shows that they principally took place among the operatives connected with the following groups of industries: Cotton, building, transport, mining, clothing, shipbuilding, engineering and iron founding and woollen. These are grouped in order of succession as to number of strikes, and are responsible for 66.44 per cent. of all the strikes of the year. The geographical distribution shows that the proportion of strikes for Ireland and Wales, as compared with England and Scotland, is greater than in the previous year.

Disputes as to wages have, as usual, been the most prolific causes of strikes, not less than 639, or 62 per cent. of the whole, have originated in this way. Of these, 436 were for advance of wages, 83 were against reductions of wages. Of those for advances of wages there were entirely successful 41.6 per cent.; 27.1 per cent. were partially successful; 21.1 per cent. were not at all successful, but results in the balance of cases were not ascertained. In respect to strikes against reduced wages, 41 per cent. were successful and 16 8 partially so; 33.74 per cent. being quite unsuccessful. Thus as nearly 60 per cent. of this class of strikes was attended with more or less success, it would appear that the reduction movement, in many cases, had been premature.

There were but 23 strikes for reduced hours of labor, of which 43½ per cent. were entirely successful and 26 per cent. partially so.

There was during the year a considerable increase in the number of strikes arising out of trade unionism and the enforcement of, or opposition to, its principles. Not less than 59 had their origin in the refusal of trade unionists to work with non-unionists, but this class of dispute has not been attended by any great measure of sucess, no less a proportion than 57.6 per cent. being unsuccessful. These disputes were principally among the unions of unskilled labor recently formed. There was a falling off in the number of sympathetic strikes, and of those which did take place under that head 63.1 per cent. were defeated. Of the whole 1,028 strikes of the year 37.3 per cent. were entirely successful; 22.4 per cent. achieved partial success; 31.3 per cent. were defeated entirely, and in the remaining cases no definite results were ascertained. In 1889 the proportion of successes was rather greater than that shown in the above figures.

In the respect to numbers of persons engaged in successful or unsuccessful strikes, the returns received show, that in 275 successful strikes 213,867 persons were involved, while in 188 of the partially successful there were 66,029 concerned. In 254 unsuccessful disputes the numbers affected were 101,902. There are full details on this head supplied for 738 strikes, in which were engaged 392,981 persons, the proportion of those engaged in successful and partially successful being slightly over 71 per cent. of the total, so that, in weight of numerical importance, the former considerably outweigh the latter. 37,094 persons refused to turn out in these strikes.

In respect to duration, the figures come out very much the same as in the two previous years. Full particulars as to dates of commencement and termination were obtained in regard to 794 strikes. Of these the aggregate duration was 13,724 days, which gives an average duration per strike of 17.3 days. Going a little further into detail on this point, it is found that there were nine strikes, in each of which 5,000 persons or upwards were

engaged, and of these the average duration was 17.8 days. There were 46 strikes in which the numbers involved were from 1,000 to 5,000 persons, and the average duration was 23 days. Sixty-four strikes were of 500 to 1,000 persons, and these lasted 20 days on the average. Two hundred and eighty strikes were of from 100 to 500 persons, and these continued 19.6 days. Of 339 strikes of less than 100 persons, the average duration was 19 days. Summing up all those in which both duration and number of persons concerned is known, there is found to have been 652 strikes, of an aggregate duration of 12,039 days, or an average of 19.88 each for 373,650 persons. Now, in 1888 the average duration was 19 days, and in 1889 it was 18.6 days. There is thus a wonderful correspondence as to duration in each of the three years.

In comparison with the full working power of the nation, whether as to persons or as to the time worked, this proportion of losses from strikes would appear to be much less than is generally supposed.

As to modes of settlement, conciliation, as usual, fills the foremost place, 56.3 per cent. of the whole having been directly arranged in this way, while 15 settled by mediation and 37 by arbitration, would really be first arranged by conciliation. During the last few years there has been an increase of the feeling in favor of these methods of disposing of industrial quarrels, and, strange to say, this prevails most strongly amongst the new organizations of unskilled labor, which are otherwise generally most extreme in their modes of action

Upwards of 200 trade unions have expressed opinions as to the best means of preventing or settling trade disputes. Of these, 92 are in favor of the establishment of conciliation boards, and one of these even goes so far as to ask for a Government board of conciliation. Fifty-nine are in favor of arbitration, 2 would make arbitration compulsory, and 5 would have State boards of arbitration. Twenty-five hold that the more general adoption and recognition of trade union principles would be the most efficacious remedy, while State regulation of workshops and hours of work, universal eight hours' day, more labor representation, and more mutual respect and confidence between capital and labor have each two supporters. One suggests nationalization of the land, and another would abolish the capitalist system.

A considerable proportion of employers of labor also made suggestions, and of these the greater number are in favor of conciliation, in which is included sliding scales, while another large section favor arbitration, and a great many of these suggest that there should be State boards of arbitration and conciliation. Others would render trade unions illegal, and would, in some way or other, prosecute or suppress the agitating trade demagogue or agitator. A strong demand is also made for the abolition of picketing, and for non-interference by the State, the press or other outsiders. A few recommend profit sharing or co-operation, while others, in a sarcastic vein, advise that workmen shall be conceded all they ask for. It is, however, to be noted that in the vast majority of cases the suggestions put forward are made with a good faith and seriousness which proves how fully the gravity of the situation is realized, and there is manifest a full recognition of the fact that a better state of things is only to be brought about by conciliatory means.

In a considerable number of cases employers have furnished details as to some elements of loss caused by strikes. Thus for 1,427 firms it is found that the weekly wages paid previous to the strikes were £261,295. in 680 establishments the value of fixed capital laid idle was estimated at upwards of £32,000,000. By the simple closing, paying fixed charges, etc., while closed, and re-opening of their works, 541 firms lost £151,343. In 13 strikes, involving 221 establishments, the Employers' Associations interested in the disputes expended £41,780.

A special effort has, for this report, been made to arrive at some means of estimating the losses and gains by or to workmen from strikes. This has been done at the express desire of some of the trade unions, which objected to a statement of losses only, without any attempt being made to estimate also the gains of strikes to workmen. In 304 strikes, as reported by trade unions, 185,759 persons were directly concerned and 33,050 indirectly. For 218 strikes the trades' unions spent in support thereof £88,809, and in 92 of these strikes 1,817 men returned to work during the strike, which is not a large proportion of desertions. In the 232 strikes, of which the returns furnish the necessary materials for a

comparison, the estimated weekly wages before the strikes amounted to £244,467, while after the strikes they are stated to be £261,373. In these cases there were 178,517 persons concerned, and there is thus an estimated gain in increased weekly wages of £16,906. In seven unsuccessful strikes there was a loss per week to 10,111 persons of £1,068. The loss of wages which might have been earned must be estimated, for those cases, at £578,895. To this must be added the amount spent by the unions in support of the strikes. We have thus a total of weekly gains of £17,974, less £1,068 of weekly losses, which is £16,906 as against loss of wages which might have been earned and expenditure on the strikes of £675,916. Dividing this total by the net weekly gains, it is found that in 40 weeks the strikers would have recovered their losses, provided work went on after the strike as before, and assuming that the advances were retained by all the workers. Other tables in the report are provided which will enable this comparison to reach much further if desired. It is sufficient to say here that the trade unions have been invited during the year to supply statments of their gains and losses of wages, not only by reason of strikes but as obtained without strikes. These statements have only been supplied to a limited extent, but such as they are they show that 182,637 persons have, after strikes, advanced their wages in the aggregate by £28,188 per week, while 31,078 have in the same way had their working hours reduced by 2 4-5 per week. Without strikes, but by negotiation and in other peaceful ways 225,710 persons have obtained advances amounting to £28,054 per week, and 53,254 have obtained an average reduction of $2\frac{2}{3}$ hours in their week's work.

On the other hand 10,478 workers, after unsuccessful strikes, have lost in wages £1,081 per week, while without strikes 2,639 persons have lost an aggregate of £566 per week, and 180 had their hours increased by $1\frac{2}{3}$ per week. These figures represent, it is true, but a small proportion of the whole of the workers of the Kingdom, but it is felt that they truly reflect the wage and hours of labor fluctuation of 1890 with tolerable accuracy for the industries of the nation at large. The lockouts of the year are so small in number and importance as to call for no special mention.

The Eight Hours Movement.

In pursuance of the method adopted in the Report of last year, it is now necessary to briefly summarize some of the more important features of the general labor movement of the year 1890. In doing so, no pretence is made of conveying new information in the sense of news on these matters. Writing so long after date, that is of course impossible, and all that is aimed at is the official placing on record for future reference of the chief facts which go to make up the history of the labor question as it assumes new or altered forms from year to year. Altogether, apart from the questions as to wages and other minor issues which have caused so many disputes during the year, the question of shortening the hours of labor has been steadily pressed to the front, not only as a subject interesting and important to many special trades, but also as the most urgent problem of labor politics. As will be seen from the tables in the appendix to this Report, the hours of labor have been further shortened in many industries by the voluntary efforts of those employed in them. Sometimes this has only been effected by a strike, but often by amicable arrangement between employers and employed. That aspect of the question, however, which has been most freely discussed, is the one presented by the parties who advocate the establishment of an eight hours day by legislative enactment.

In last year's Report the record of what had been done by the organized trade unions of the Kingdom in this direction was to be found in the reports there quoted of the Trades' Union Congress, and of other congresses of labor held elsewhere. One special feature of this movement is its international character, and the workers of all the most important European nations are endeavoring with more or less energy and enthusiasm, to press this industrial problem upon the attention of their respective governments. It is desirable, therefore, in trying to ascertain what progress has been made by the advocates of this legislative movement, to glance shortly not only at what has been done at home, but also at what has been effected by the foreign workmen who have been professing to work in concert with the British trade unions who are favorable to the proposed

change. Quite a new eight hours literature has sprung up, and the arguments both for and against the new departure in legislation have been very truly stated, both through the press and on the platform. Into the merits of the dispute it is not possible to enter here, all that is proposed is to make a statement of the facts, so far as they are shown by the resolutions of congresses and other labor gatherings.

It will be remembered that at the Trades Union Congress of 1889, held at Dundee, the question of a legislative eight hours day was left in what may be termed an open condition. The resolution then put was: "That the maximum working day for all trades be eight hours." This proposal was lost by 88 votes to 63. A large section of the miners of the Kingdom, however, were of opinion, not only that eight hours per day should be the maximum of their trade, but also that this maximum should be fixed for them by Act of Parliament. The Dundee Congresss so far agreed with them as to pass the following resolution: "That this Congress desires to express the opinion that the time has fully come when there should be an eight hours Bill for Miners, and we hereby request the Parliamentary Committee to consider at the earliest date, and to prepare a Bill to be presented to Parliament."

The Parliamentary Committee of the Trades Union Congress several times had the matter before them during the session of 1890, but did not draft a Bill. In the meantime, however, the Miners' National Federation, representing on this subject the majority of the miners of the Kingdom, had adopted and resolved to support a measure introduced into Parliament by Mr. Cuninghame Graham, M.P., entitled "A Bill to Restrain Labor in Mines to Eight Hours per Day." This Bill was first brought forward in the session of 1889, and, in addition to the gentleman already named, was backed by Mr B. Pickard, M.P., Mr. Abrahams. M.P., Mr. Conybeare, M.P., and Mr. Phillips, M.P. The full text of the Bill was as follows:

"Whereas it is expedient to limit the hours of work underground by persons employed in mines;

"Be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows:

"1. This Act may be cited as the Miners' (Hours of Work) Act, 1889.

"2. A person shall not, in any one day of twenty-four hours, be employed underground in any mine for a period exceeding eight hours from the time of his leaving the surface of the ground to the time of his ascent thereto, except in case of accident or other emergency.

"Any employer, or the agent of any employer, employing or permitting to be employed, any person in contravention of this enactment, shall be liable to a penalty not exceeding *forty shillings* for each offence, to be recovered in the same manner in which any penalty under the Acts relating to factories and workshops is recoverable."

During the year in question, however, beyond occasional references, no progress was made with the Bill, and it was again introduced at the beginning of the session of 1890, the only alteration made in the text being those as to date and the deletion of the words "or other emergency" from the end of clause 2. Still no progress was made, but again in its slightly altered form the measure was introduced by Mr. William Abrahams, M.P., in the November of 1890, the Bill being then backed by eight additional names. During the whole of the session of 1890-91, no opportunity arose of fully debating the Bill on its merits, although numerous attempts were made by its promoters to have a special day fixed for its discussion.

In the meantime, however, the Trades Union Congress of 1890 met at Liverpool, and so far as this gathering is concerned the agitation may be said to have advanced a stage. In the first place, a strong attack was made upon the Parliamentary Committee by the representatives of the Miners' Federation for not having introduced a Bill as directed by the previous Congress, and this was followed up by a debate and resolutions, not merely in favor of an eight hours Bill for miners, but also of a Bill applicable to all trades. The resolution submitted was as follows:

"That in the opinion of this Congress the time has arrived when steps should be taken to reduce the working hours in all trades to eight per day, or a maximum of forty-

eight hours per week ; and while recognizing the power and influence of trade organizations, it is of opinion that the speediest and best method to obtain this reduction for the workers generally is by Parliamentary enactment. This Congress, therefore, instructs the Parliamentary Committee to take immediate steps for the furtherance of this object."

The following amendment was moved :

"That in the opinion of this Congress it is of the utmost importance that an eight hours day should be secured at once by such trades as may desire it, or for whom it may be made to apply without injury to the workmen employed in such trades ; further, it considers that to relegate this important question to the Imperial Parliament, which is necessarily from its position antagonistic to the rights of labor, will only indefinitely delay this much-needed reform."

The discussion which ensued was chiefly notable from the fact that the principal speakers on each side were representatives of the miners, those of Northumberland and Durham supporting the amendment, and those of the National Federation of Miners speaking in favor of the resolution. On the voting for the amendment the figures recorded were, for the amendment, 173 ; against, 181 ; so that the majority was but eight against it. The resolution was then put to the vote, and the numbers were—for, 193 ; against, 155 ; a majority of 38.

This vote, though apparently decisive, shows really a great division of opinion, and proves that there is no approach to anything like unanimity on the question. Analysis of the trade elements making up the vote would show broadly that a majority of the more skilled trades are against an eight hours day by legislative enactment, and that the demand for it was made most strongly by the National Federation of Miners, and the representatives of the new unions of unskilled labor. Nor can the mode of voting adopted be considered as at all calculated to settle definitely for the trades of the Kingdom a point so important as this. The voting of the Congress was by show of hands, and each delegate present was entitled to vote.

Under such a system it was possible for a vote of the majority of Congress to represent but a minority of trade unionists. Thus, for instance, the Boiler-Makers' and Iron Ship Builders' Society, with a membership of 35,000, had two delegates, while the Mersey Flatmen's Society, with only 1,100 members, had four delegates, and thus outvoted the larger society by two to one, although with but one-thirtieth of its membership. So also the Amalgamated Tailors' Society, with 17,000 members, had two delegates, and had its vote neutralized by the Bolton Laborers' Union of 1,200 members. Six thousand Steam Engine Makers had one vote only, while 2,000 Firewood Cutter had two votes.

The Amalgamated Engineers, with 65,000 members, were divided in their vote, but had only five delegates, while the Sailors and Firemen's Union, with a somewhat similar number of members, was able to record more than four times the number of votes, having over twenty delegates present. These are a few of the most striking out of the many anomalies presented by the list of societies, and delegates constituting the congress ; but on whichever side they may tell, they show that the system of voting adopted is not such as to secure a fair reflex of the general trade union opinion of the Kingdom on any subject of importance about which there is much difference of opinion.

Such as it was, this vote of the Congress created so strong a feeling that the textile trades threatened to sever their connection with the congress, and those of their representatives who were elected to serve on the Parliamentary Committee for the following year declined to take their seats on that body, and were replaced by others.

As has already been recorded, the eight hours Bill for miners was re-introduced in Parliament shortly after the Congress ; but in view of the resolution just referred to, it became the duty of the Parliamentary Committee to draft a general eight hours Bill. This Bill was "prepared and brought in by Mr. Cuninghame Graham, Mr Randell, Mr. W. Abrahams (Rhondda), Mr. Conybeare, and Dr. Clark," and was entitled "A Bill to restrict the hours in all trades and industries to eight per day." The full text of the proposed measure was as follows :

"Whereas it is desirable and expedient to protect the industrial classes against the evils arising from excessive hours of labor,

"Be it therefore enacted . . . . as follows:

"1. On and after the first day of January, one thousand eight hundred and ninety-two, no person shall work, or cause or suffer any other person to work on sea or land in any capacity under any contract or agreement, or articles for hire or labor, or for personal service on sea or land (except in case of accident), for more than eight hours in any one day of twenty-four hours, or for more than forty-eight hours in any week.

"2. Any employer, manager, or other person who shall knowingly cause or suffer any person subject to his or her authority or commands, or in his or her employment, to work on sea or land in any capacity, under any contract or agreement, or articles for hire of labor, or for personal service (except in case of accident) for more than eight hours in any one day of twenty-four hours, or for more than forty-eight hours in any week, shall, on conviction, be liable to a penalty of not less than ten pounds, nor more than one hundred pounds for every such offence.

"3. All offences under this Act, and all money and costs directed by this Act to be recovered as fines, may be prosecuted and recovered in a manner directed by the Summary Jurisdiction Acts before a court of summary jurisdiction.

"4. Summary orders under this Act may be made on complaint before a court of summary jurisdiction in manner provided by the Summary Jurisdiction Acts.

"5. This Act may be cited for all purposes as the Eight Hours Act, 1891."

This Bill was not, however, more fortunate than that of the Miners and never reached the second reading stage. Thus, for the present, ends the record of the parliamentary course of this agitation. The matter again came up for discussion at the 1891 Congress held by the trade unions at Newcastle, but this was held at a period of the year too late to permit of treatment in this report.

While this has been going on in England, a considerable section of British trade unionists, feeling that any general attempt to further reduce the hours of labor in this country, should also, if possible, be accompanied by a corresponding movement on the continent, have taken part in international conferences of workmen at which this subject was discussed.

[The conferences just referred to were those held at Berlin, Germany; Jolimont, Belgium; Paris, France, and Brussels in Belgium.]

Taking up the Eight Hours Day question where the Report of the Imperial Board of Trade Correspondent left it, as passed upon by the Trades Union Congresses prior to the year 1891, it is found that the Twenty-fourth Trades Union Congress of the United Kingdom met in Newcastle-upon-Tyne in September, 1891.

On the second day of the meeting it was moved and seconded,

"That in the opinion of this Congress the time has arrived when the Government of the United Kingdom should endeavor to bring about, in conjunction with all foreign governments, an international reduction in the hours of labor to eight hours per day, and further demands an international conference for that purpose."

An amendment was moved in the following words:

"That in the opinion of this Congress, it is impossible to establish a universal uniformity of hours without inflicting very serious injuries to workers in those districts and countries where the natural conditions are least favorable for the procuring of subsistence. It, therefore, cannot agree to support this bill for the establishment of a universal eight hours day."

This resolution and amendment outlined the difference, in a very large degree, existing in the ranks of those constituting the Congress, and no doubt the difference of opinion on this same subject which existed among their constituents on the matter as well. The

amendment was lost on the following division—for the amendment 136, against, 302, or a majority of 166.

On the third day of the Congress the following resolution was offered :

"That in the opinion of this Congress it was detrimental to many trades to fix a legal eight hours day for all workers, and taking into consideration the fact that there are many trades in which it is impossible to fix any specific number of hours as constituting a day's work, this Congress is of opinion that while eight hours is sufficient for a day's work, that such eight hours should not be obtained by legal enactment but by trades union effort, and pledges itself to assist, by any and every means possible, every trade that is trying to secure such a boon for its workmen."

Having compared this resolution with those of the day before the chairman ruled it out of order, in that they were alike.

Being declared in order it was then moved,

"That in the opinion of this Congress any bill for the reduction of the hours of labor should be of a permissive character, and should not be put in operation without the consent of at least two-thirds of the organized members of any trade."

On a division the vote stood, for the amendment 242, against 156, or a majority for optional adoption of 86. This swept away the original resolution with its amendment, and as the amendment just carried became the substantive resolution, further amendments were in order.

After several amendments had been submitted and ruled out of order for one reason or another, it was moved and declared in order,

"That legislation regulating hours of labor to eight per day, shall be in force in all trades and occupations, save where a majority of the organized members of any trade or occupation protest by a ballot voting against the same."

The chairman having read the original motion which made the eight hours permissive while the amendment would make it so only provided that two-thirds were in favor of it. The amendment was then put to the meeting with the following result: For 285, against 183, a majority for of 102. The main motion as amended was then put and carried on the following division: For 341, against 73.

And so stood the Eight Hours Day Question in the United Kingdom, in so far as the same has been passed upon by the representatives of labor in that country up to September 9, 1891.

LABOR REPORT OF GREAT BRITAIN FOR 1891.

Strikes and Lockouts.

The Labor Correspondent of the Imperial Board of Trade of Great Britain, who is a permanent officer, in his annual report for 1891, in speaking of the "chief strikes of the year" throughout the Empire, says :

None of the principal strikes of 1891 call for very special notice, the circumstances connected with them presenting no features of novelty or interest. Among those of greatest importance, however, reference may be made to the strike early in the year of the laborers employed upon the Railway Relief Works in Ireland, in which about 1,200 men were concerned. The cause of dispute was a demand for increased wages, the men being defeated.

In the month of February the demand by the Seamen's and Dock-labor unions for the employment of union labor only led up to a serious stoppage of five weeks' duration in the port of Cardiff; 5,000 laborers and seamen were involved in this dispute, which

practically took the form of a struggle between the Seamen and Firemen's Union and a combination acting on behalf of the shipowners, called the Shipping Federation. The men were defeated and a heavy blow was thus struck at the movement which insisted upon the employment of nothing but union labor. About the same time the Liverpool dock laborers came out on strike for a similar object. They insisted that union men should be allowed to wear distinctive badges, but the employers, seeing in this a manifest desire to favor union labor specially, refused to make the desired concession, and the 2,000 men who came out on strike were unable to enforce their demand.

An ill-considered and hasty strike brought out 11,000 men from certain of the pits in the county of Durham during the month of February. This strike was sympathetic in character, and was intended to assist the men at Silksworth Colliery, who, since the previous November, had been on strike with the object of compelling all the deputy overmen in the pit to join the Miners' Union. The Miners' Union, however, disapproved of this extended strike, and it came to an end after an average duration of some three days. Many of the workmen were afterwards fined for breach of contract by leaving work without giving legal notice. Following upon this came a strike by 3,350 miners, all of whom were employed at the other collieries of the proprietor of Silksworth, the object of this strike also being to induce a settlement of the original dispute, which had been pending nearly five months and during which the miners on strike had been forcibly evicted from the colliery houses. This further sympathetic strike lasted three weeks, at the end of which interval the Silksworth dispute was arranged by a compromise under which it was left open to the deputies to join whichever union they pleased. For six weeks the box and packing case makers of the metropolis were on strike in February and March for an advance of wages, but were not successful. In the following month a serious stoppage took place in the Glasgow steel trade, no less than 2,700 steel workers being thrown out of work by a strike of 210 gas producer-men against their inclusion in a general reduction of wages arranged between the steel workers and the employers. The stoppage lasted nine days, and the gas men were replaced by others.

Also in April came another of the long series of strikes in respect to the demarcation of work question which for several years unsettled the engineering and shipbuilding trades of the River Tyne. In this case the engineers employed at the works of Sir C. W. Palmer & Co., Jarrow, came out on strike because, as they alleged, the plumbers employed in the shipbuilding were encroaching upon the work of the engineers as defined at a conference held some months before. The number of men actually striking was not large—no less than 2,460 were ultimately affected ; the strike lasting into June, at which point the associated employers took joint action and threatened a lockout of all the members of the Amalgamated Society of Engineers, which body they considered responsible for the dispute. By the efforts of the Mayor of Newcastle, however, a conference was arranged and a board of arbitration was agreed to. Later in the year the engineers of the Tyne and Wear came out on strike for a restriction of overtime, and after a stoppage of a fortnight an agreement was arrived at whereby overtime was restricted to 18 hours in any one month. Also in April there took place a successful strike of 2,000 brickmakers in the West Drayton District of Middlesex for an advance of wages, but the strike was of such long duration as to greatly discount the advantage gained. There was again a strike of London cabmen against the rates charged to them by cab owners for their vehicles and horses. The dispute was in progress from April to June and 2,500 men, who were employed by 35 cab proprietors, were affected. In some cases the men were successful in their objects, but in others no modification of terms was obtained.

In May there were two important strikes of London tailors affecting together upwards of 20,000 persons. In the first case the West End and city tailors succeeded, after a nine days' stoppage, in their object of obtaining better arrangements as to workshop accommodation, a uniform time log and the abolition of partnership-working in the making of single garments. In the second strike it was the East End tailors who came out for similar objects, but demanded also the abolition of the middleman or "sweater." These, however, were not successful, their organization not being so good as that of the West

End men. The strike continued for about three weeks, and as showing to what extent the East End trade is carried on by small employers, it was estimated that not less than 1,400 shops were affected.

In June there was a stoppage of work by the omnibus men of the metropolis, who, to the number of 8,000, struck work for a reduction of their hours of labor, an effort in which they achieved some measure of success. About the same time the fustian cutters of Cheshire and South Lancashire came out on strike for an advance of wages, and were partially successful.

In the following month there commenced a strike of 10,000 iron shipbuilders on the River Clyde, which was chiefly notable for the revolt of the men against the orders of their executive council.* This stoppage lasted during six weeks, although the men were refused the support of their union.

In August 6,000 Welsh miners were out for a week in support of a demand for an alteration in working arrangements, but resumed work on a satisfactory basis.

In October 10,000 boot and shoe operatives in the East End of London were locked out five days in consequence of the workmen of one firm having struck work in contravention of the rules of the Trade Board of Conciliation and Arbitration, which, in the opinion of those on strike, had not rendered a decision as to disputed prices with sufficient promptitude.

The net result of the observations and inquiries made as to the number of the disputes of 1891 is to show that in all 893 strikes took place during the year, in addition to which there were 13 lockouts. The number of establishments affected, so far as they have been definitely ascertained, was 4.507, but this figure is derived from but 839 of the total strikes. There are also a few important strikes in which it has not been possible to get to know the exact number of firms involved, such as the London omnibus strike and the strike in the London book-binding trade. The 13 lockouts involved 48 establishments.

The textile and mining industries head the list of disputes in 1891. In most trades the chief elements of dispute arise as to questions of wages and hours of labor, but in the two trades mentioned to these prime causes are to be added a continual varying of the conditions of production, which, payment being by the piece, give rise to endless controversy and dispute. In cotton manufacture this seems especially to be the case, and thus we have no less than 156 strikes entered against this branch of trade, which amounts to 17.37 per cent. of the total number. If we add to cotton all the other divisions of textiles on the list we get a total of 204, thus making one large branch of trade responsible for more than one-fifth of all the disputes of the year. Mining and quarrying, being kindred industries, may also be grouped, and are found to have been engaged in 134 disputes, which is 14.9 per cent. of the total. These two great staples, mining and textiles, are thus jointly answerable for 37.64 per cent. of the strikes taking place during 1891. The group of industries classed under the head of building trades had 147 strikes, which is 16.37 per cent. or just about one-sixth of the total. The cognate trades—shipbuilding, engineering and iron founding—come next with 92 strikes, which is 10.24 per cent. ; and the clothing trades follow with 64, or a little over 7 per cent. All the various branches of transport labor show 61 strikes, or 6.8 per cent., which is much less than they were responsible for in 1890, when their proportion was upwards of 15 per cent. This leaves but 22 per cent. to be divided among the miscellaneous iron trades and all the other general trades of the Kingdom.

*The employers' association had given their employees in the iron shipbuilding notice of a 7½ per cent. reduction. The notice expired on the last days of May, but, as no settlement had been arrived at, its operation had been deferred for another month. During that period negotiations went on between district committees and district delegates on the men's behalf and the employers' association, but terms were not arranged. Ultimately, however, a settlement on the basis of a 5 per cent. reduction, to affect shipyard hands only, was accepted by the executive council on behalf of the men This was not accepted by the Clyde men and a strike resulted. The refusal on the part of the men to accept the council's ruling in the matter may be to some extent explained by the fact that up to a recent date all differences of this kind on the Clyde had to be ended by the barbarous method of a strike, as the men's association was not recognized by the employers.—Note.

SUMMARY.

	Strikes.			Lockouts.		
	Number.	Number in which details of the persons affected are known.	Number of persons affected.	Number.	Number in which details of the persons affected are known.	Number of persons affected
England	667	509	207,232	12	10	485
Wales	63	45	21,540	.....	.....	.....
Scotland	125	93	29,012	.....	.....	.....
Ireland	38	29	9,101	1	1	90
Total	893	676	266,885	13	11	575

From this summary it appears that three-fourths of the strikes of the year took place in England, with an average of 407 persons affected per strike. Seven per cent. took place in Wales, with an average of 478 persons. In Scotland 14 per cent. of the strikes took place, with an average of 312 persons affected. Ireland had but 4 per cent. of the total strikes, with an average of 314 persons affected.

GENERAL SUMMARY.

As trade had palpably begun to decline, 1891 was not so good a year for the trades as was 1890. The strike figures are less than in 1890. There were recorded during the year 893 strikes, affecting, as far as is known, 4,507 establishments. There were 13 lockouts, affecting 48 establishments. The textile industries were responsible for more than one-fifth of all the strikes of the year, the mining trade coming next with 14.9 per cent. of all the strikes. The building trades account for 16.37 per cent., and the trades of shipbuilding, engineering, etc., for 10.24 per cent. The branches of labor under the head of transport trades had 6.8 per cent. to their account, leaving 22 per cent. to be partitioned among all the other trades of the country.

Disputes as to wages were the chief causes of strikes, 54.2 per cent. of the total arising therefrom; 30.23 were due to the demands for advance of wages. In the three previous years the proportion of strikes due to wages disputes was, in 1888, 62; and in 1889, 67 per cent. on a rising market; the percentage of advance of wages strikes in 1890 was 42.4. The strikes against reduction of wages were 11.6, as against 8 per cent. in 1890. Success to the strikers attended 45 per cent. of the wages strikes of the year, while 23.4 per cent. had a partial success. The number of persons engaged in the unsuccessful strikes was, however, much larger than in the case of the successful or partially successful strikes. Strikes arising out of demands for reduced hours or other questions as to duration of working time were not numerous, 23 being the total in this class. In not less than 87 per cent. of these cases complete or partial success was obtained.

Strikes against the employment of non-union labor numbered 47, the greatest proportion of which, 51 per cent., were entirely unsuccessful. There were but few partial successes, this being a question of principle in which compromise is difficult. The successful strikes under this head form 36.2 per cent. of the whole of the class, but it is among the unsuccessful ones that much of the larger proportion of persons involved is to be found. There were not less than 31 strikes arising out of disputes between rival sections of workmen as to the demarcation of their respective trades. These involved no fewer than 7,469 persons and much loss to the parties concerned, which might have easily been avoided by a reference to arbitration before any cessation of work took place.

A general review of all the results shows that in 676 of the chief cases 266,885 workpeople were concerned; 369 out of 893 strikes were known to be successful, which is a

proportion of 41.32 per cent., in which 68,247 persons were engaged. One hundred and eighty-one, or 20.27 per cent., with 98,127 persons affected were but partially successful. Two hundred and thirty-six, or 29.45 per cent., with 92,763 persons involved, were entirely unsuccessful. This analysis brings out the fact that in the matter of success or otherwise the strikes of 1891 were slightly more favorable to the strikers than those of 1890. The lockouts of the year are neither sufficiently numerous nor important to call for special mention. It is to be remarked that the building trades, by virtue, probably, of their superior organization and other special circumstances, have achieved a much larger measure of success in their disputes than any other branch of industry. The average duration of the strikes of the year is found to be about four weeks, a term slightly longer than in the three previous years. The returns from employers show that for a certain number of those on strike there was a weekly wages bill of £100,000 previous to the strike. Estimating from this the weekly wages of 295,000 persons engaged in all the strikes of the year, a total of weekly wages is obtained of £381,000, which, at an average duration of four weeks per strike, gives a total of wages which might have been earned during that time of about £1,500,000. The figures returned by some of the trade unions would appear to make the total much greater than this amount. Particulars from 293 establishments show that in the aggregate the value of their fixed capital laid idle was £9,493,031, while 273 firms report that the actual outlay caused by stopping and reopening their works amounted to £92,238. In 57 strikes employers' associations took an active part at a cost of £17,000.

Particulars sent in by trade unions for 234 of the strikes of the year show that 71,404 persons were directly concerned, with 1,747 indirectly affected. The weekly wages of those directly affected before the strikes took place amounted to £89,667, and after the strikes to £94,325, an apparent gain in wages per week of £4,658. A further trade union statement shows that after strikes there was a gain in weekly wages to 51,589 persons of £6,235, and a loss in weekly wages to 15,223 persons of £1,476.

Wages' gains without strikes are estimated by the unions at £11,770 for 140,382 persons, and wages' losses without strikes at £2,204 per week.

In 261 strikes in which trade unions were actively interested 51,203 persons were involved, and their maintenance caused an expenditure of £145,785, or £2 16s. 11¼d. per head, and of this sum it is fair to assume that a considerable fraction thereof has been distributed among those who were not members of the trade unions.

As to the hours of labor the returns show, that, after strikes, 13,764 persons reduced their hours by 2¼ per week, but without strikes 38,127 persons had their hours shortened by 2⅔ hours per week. Against this is only to be set 120 persons who had their hours increased by 3⅗ per week. It would thus appear that though in 1891 the turn of the tide had been reached, in some industries the conditions of labor continued to improve.

Public Contracts and Fair Conditions of Labor.

In this direction the trade unions and workmen generally have been very active during the year throughout the Empire. This activity has manifested itself in most districts by increased attention to matters of municipal government, and also in the exercise of the political influence of the unions in Parliament. On county councils and other municipal bodies a greater number of direct representatives of labor have been elected than ever before, and the cry for fair conditions of labor in work executed for the community at large has met with a large share of public acceptance, and has been popular among most classes because it embodied a demand for justice not only for the workers but for the fair and honest employer, who in paying his men at the highest standard was undercut by those who paid the cheapest rates. Thus in many public bodies now it is a recognized principle that in all contracts a clause shall be inserted insisting on the payment to the workers of fair wages, as recognized by the trade unions, and the maintenance of such hours and other conditions of labor as are customary in the trades concerned.

The effect, or at least one effect, of this has been to increase the tendency on the part of public bodies to become the undertakers of the public work without the intervention of contractors, and the experiments of this kind now being tried in various places will be

carefully watched with a view of testing whether public bodies are as efficient directors of industry as are found under a system of private enterprise.

The justness of the demand for the protection of the interests of labor as involved in public contracts has also been recognized in the larger contracts of the nation, and the Government has done much to insure that in all their work let out to contract fair conditions of labor shall prevail and that it shall not be let out to sub-contract. In order that it may be clearly understood to what extent this principle has now been admitted in Government departments it may as well be stated here that on the 13th February, 1891, the Imperial Parliament concurred in the following:

"*Resolved*, that in the opinion of this House it is the duty of the Government in all Government contracts to make provision against the evils recently disclosed before the Sweating Committee, to insert such conditions as may prevent the abuse arising from sub-letting, and to make every effort to secure the payment of such wages as are generally accepted as current in each trade for competent workmen."

In consonance with the spirit of the foregoing, Sir John Gorst, on the motion of Mr. Sydney Buxton, presented to the House a return from which some extracts are here given:

Circular issued by the Admiralty to their Contractors.

GENTLEMEN,—I am directed by my Lords Commissioners of the Admiralty to call your attention to the resolution (quoted above) passed by the House of Commons on 13th February, 1891, and to state that they expect those who are entrusted with contracts for the Admiralty to adhere to its conditions.

My Lords will be compelled to consider the question of removing the names of all who fail to comply with the resolution from the list of those allowed to undertake work for this department.

You are requested to be good enough to acknowledge the receipt of this letter.

(Sgd.) EVAN MACGREGOR.

February 16th, 1892.

Copy of Correspondence re Clothing Contract.

Board of Trade to Messrs. ————

5th June, 1891.

GENTLEMEN,—Referring to your tender for clothing, dated the 6th ultimo, I am requested by the Board of Trade to state that they require you to pledge yourself that the wages you will pay under this contract, in the event of your tender being accepted, are those generally paid in the tailoring trade. I am, etc.,

Signed.

Extract from Conditions of Contract.

"5. The contractor undertakes that all garments included in this contract shall be made up in his own factory (give location), and that no work shall be done at the homes of the workpeople. Any infringement of this condition, if proved to the satisfaction of the President of the Board of Trade, shall render the contractor liable to a penalty not exceeding £100 for each offence, which may be deducted in the manner laid down in clause 6.

"6. No portion of this contract shall be transferred without the written permission of the President of the Board of Trade. Sub-letting, other than that which may be customary in the trades concerned, is prohibited."

Contracts to contain Proviso for Payment of Wages at Current Rates, and not to be transferred or sub-let.

"With reference to the resolution of the House of Commons on the 13th February last, ... the Board direct that in future specifications upon which tenders are

invited for supplies for the service of this department are to contain a clause providing that the contractor shall pay for whatever labor is employed in the fulfilment of his engagement to the Crown at the rate of wages current in the district in which his business is carried on, and that the contract shall not be transfered or sub-let."

Extract from Clothing Contract.

"10. The contractors undertake that all garments included in this contract shall be made up in their own factory at ———, and that no work shall be done at the homes of the workpeople. No portion of this contract shall be transferred without the written permission of the commissioners. Sub-letting, other than that which may be customary in the trades concerned, is prohibited. The wages paid in the execution of this contract shall be those generally accepted as current in each trade for competent workmen in the district where the work is carried out. Any infringement of this condition, if proved to the satisfaction of the commissioners, shall render the contractors liable to a fine not exceeding £100 for each offence, which may be deducted in the manner laid down in clause 11 of this contract."

Stipulations akin to those quoted in illustration as to how the Order of the House of Commons is being complied with are in the contracts of every branch of the public service. Every person or firm putting in a tender for ordinary works and repairs to buildings, etc., under the control of the Board of Works are obliged to append a statement of the minimum and maximum rates of wages they intend to pay for every form of work necessary to be performed, as per following

SCHEDULE OF RATES within which the Wages of Workmen employed on Day Labor will be paid (special cases excepted).

——	Minimum rate per hour.	Maximum rate per hour.
Excavator, navvy, or mudmen		
Scaffolder		
Bricklayer		
Mason		
Stone carver		
Carpenter or joiner		
Slater		
Plasterer		
Smith or bell hanger		
Coppersmith		
Plumber		
Certificated sanitary plumber		
Brassfitter		
Zinc-worker		
Painter		
Paint cleaner		
Grainer or writer		
Glazier		
Paper hanger		
Laborer, any trade		
Night watchman		
Boy		

Signature of person or firm tendering.....

N.B.—The prices filled in the first column (minimum rate per hour) are to be the uniform rates now paid for efficient workmen; those in the second column (maximum rate per hour) are those to be paid.

Particulars for the Information of Persons Disposed to Tender:

2. It is the intention of the commissioners that men employed in day work should be competent workmen, who should be paid wages at rates such as are generally accepted as current in each trade for competent workmen, and persons tendering should take care that the schedule of rates submitted by them should conform to this requirement, and that the margin between the maximum and minimum rates should be a moderate one.

Copy of Clause 8 of the General Conditions of Contract for Special Works.

"The builder shall not (unless with the previous consent in writing of the first commissioner) assign over or under-let the contract for the execution of the work or any part thereof, nor let out any part of the work as task work to journeymen or taskmasters."

Copy of Clause 7 of General Conditions of Contract for Ordinary Works and Repairs.

"The contractor shall not assign or under-let his contract, or any part or parts thereof, without the consent in writing of the commissioners being first obtained, and shall not, without the like consent, make any sub-contract or sub-contracts for the execution of the works, or any part or parts thereof, or employ any taskmen in, upon, or about the works or repairs."

The Eight Hours Movement.

The Labor Correspondent of the Imperial Board of Trade, in his annual Report, in referring to the subject, takes occasion to say that during the year the question of an eight hours' working day has been always before the country, but it cannot be said that much progress has been made towards a definite settlement. An attempt to establish the eight hours' system in the London bookbinding trade, though to some extent successful, broke down on account of the want of concerted action among all the trades connected with the book-producing industry; though, had the bookbinding trade been carried on in all cases by itself and apart from printing, the result would probably have been different. There was a long strike, during which many firms which were purely bookbinding concerns, conceded the eight hours' principle, but in the end the result was compromised owing to the hostility of the large firms, employing printers also, who objected to have the different departments of their establishments working unequal hours.

In Parliament a discussion took place on the second reading of an Eight Hours' Bill for miners. The motion for a second reading was defeated by 272 votes to 160. Two Bills for obtaining a general eight hours' system were also introduced. They both provided for exemption from the operation of the measure of trades voting by majority against its application in their case. These Bills did not, however, reach the discussion stage in the House of Commons.

In the course of last year, the Report says, several private employers have, on their own initiative, adopted the eight hours' system in their works. The most notable cases have been Messrs. S. H. Johnson & Co., engineers, Stratford; Mr. James Keith, engineer; Mr. Mark Beaufoy, M.P.; Brumner, Mond & Co., chemical manufacturers; Short, shipbuilders, Sunderland; Mr. Hadfield, steel founder of Sheffield, and Mr. Wm. Allan, Scotia Engine Works, Sunderland. In each of these instances the system has been adopted with the greatest deliberation. At the Scotia Engine Works the new method of adjusting and regulating the hours of labor has been in operation twelve months, up to the date of this report, and Mr. Allan believes that he has solved the problem of the day. He arranged the matter in amicable consulation with his men, of whom he employs some 400. He explained that in making such a reduction of working hours there was neces-

sarily a certain amount of financial risk involved. To meet this the men agreed to submit to a wage reduction of 5 per cent., which in the event of the new system being found to work satisfactorily, should be returned. Under Mr. Allan's plan an important readjustment of the hours took place, the chief feature of which was the alteration of the starting time in the morning from 6 o'clock to half-past 7. Under the old system there was a considerable loss of time in the early morning, which, with the later hour of starting, was got rid of, and in this way alone an immense advantage is said by Mr. Allan to have been gained. He claims that already a great change has been made in his apprentices. A quarter past 5 in the morning is, in his opinion, too early an hour for growing lads to turn out at, leaving home in most cases with an empty stomach and having to go on till 8 o'clock before having breakfast, which they now took, under the new arrangement, before leaving home for work. There was only the one break in the day for dinner, and this gives a continuity to the day's work, which was a great advantage. At the end of six months' working Mr. Allan again called his men together. He told them that his books had not been actually made up, but from such figures as he had gone into, and from personal observation, his belief was that in quantity and quality of work they had done as well during the six months as they did on the longer hours. With that belief he had the pleasure of restoring them the 5 per cent. taken from their wages. They had, he said, responded to his appeal to make the scheme a success, and he had faith in them continuing to work in the same earnest, enthusiastic and contented manner as had marked their labors during the past six months.

Mr. Hadfield has also expressed himself strongly in favor of the system, has read an important paper on the subject, and is joint author of a book on the question, in which the matter is argued out from both the practical and theoretical points of view. Referring to the case of his own firm (Hadfield's Steel Foundry Company) Mr. Hadfield says :

"They do not claim to have applied any very startling change, in fact it is but a trifling concession. It was, however, deemed advisable to 'make haste slowly.' Their experiment of shorter hours was commenced some nine months ago. The starting time was made 6.30 instead of 6 a.m. In other words, the working hours per day were reduced from nine-and-a-half to nine, or the week's time from 54 to 51 hours. The change applied to all workers, whether belonging to the union or not, and the wages remained as before. That the change has been eminently satisfactory will be seen from the results quoted, for although alterations of method and organization were introduced about the same time, no doubt contributing much to the satisfactory results, still the writer, from many facts that have come under his personal observation, considers that one of the chief factors has been the better tone and *morale* amongst the men. It is the old tale that human nature is not irresponsive to more trust and confidence being placed in it. From 450 to 500 workers have been working under this 51 hours per week, comprising engineers, founders, fettlers, smiths and general laborers. Steel founding has as much if not more competition than in the average specialty trade. Therefore the system has had a fair field and no favor. What has been the net outcome of the experiment? As far as can be determined practically the reduced hours have not added to the cost of production. The management on its side has perfected better methods, and the workers on their side have shown more intelligent interest in carrying out of the work to be done, the result being that as much work has been done as in the former long hours. The costs show, after carefully comparing the time spent in the same class of work under the old and new systems, that there is little or no appreciable difference between the amount of work turned out per man. One important improvement has been noticed. Taking the comparison haphazard, viz., for the months of January, 1891 and 1892, in the former case out of about 500 men, 72 averaged half an hour late each morning during the month, 22 averaged a commencement of work at 9 a.m. In January, 1892, the whole of the men, except a daily average of 19, were in at work punctually at the starting time—6.30 a m. The company has, therefore, clearly saved time which, under the old regime, must have been highly wasteful through absence of the workers and foremen. The foundry foremen consider that, as far as any comparison can be made, as much work is being turned out (it goes without saying that this is so in piecework) 'and not so many quarters lost.' The engineering foremen report that owing to the men all starting together, instead of the previous desultory system, much better

results are obtained in the work. Similar results are reported from all the departments. The better supervision of the foremen and the commencement of the work with only 4 per cent. of absentees instead of 20 per cent. must in itself be a considerable monetary saving."

Important Legal Decisions under the Law Affecting Strikes.

During 1890 several important cases arose in different places which were tried before the local courts, but three of which were afterwards carried on appeal to the Court of Queen's Bench, where they were heard on the 28th and 29th of April, 1891, by Lord Chief Justice Coleridge and Justices Mathew, Cave, A. L. Smith and Charles. Judgment was given on July 14th. It is not necessary to fully state the cases, as the facts of each appear with sufficient fulness in the judgments given, nor is it requisite to state all the judgments, as one was given upon a technical issue in which the main question did not arise.

In both of the cases which follow the decisions are quoted in full from "The *Times* Law Reports:" The legal difinition of intimidation laid down by the judges in these cases is most weighty and authoritative in its character, and will doubtless form a precedent of decisive influence upon future cases of a similar kind:

Gibson v. *Lawson.*

"A case in which the circumstances are peculiar and in which, the magistrates having dismissed the charge, the appeal is against the dismissal of the summons, a course, no doubt, open to the appellant under 42 and 43 Vict., cap 49, sec. 33, the Summary Jurisdiction Act, 1879. This summons was under 38 and 39 Vict., cap. 86, sec. 7, and charged in substance that the respondent unlawfully intimidated the appellant. The respondent was employed as a fitter in the yard of an iron shipbuilding company; the appellant was employed in the same capacity in the same yard. The respondent was a member of a society called the Amalgamated Society; the appellant was a member of a society called the National Society. On December 3rd, 1890, a meeting of the Amalgamated Society was held, at which it was resolved that the members of that society would strike unless the appellant left his society and joined them. The respondent communicated this resolution to the foreman of the shipbuilding company, who communicated it to the appellant. Thereupon the appellant had an interview with the respondent. In the result the respondent informed the appellant that the Amalgamated Society were determined to carry their resolution into effect, but gave him till the morning of the 6th to make up his mind. The appellant adhered to his own society, and the shipbuilding company, in order to avoid a strike, dismissed him from their yard. It is expressly found in the case that no violence or threats of violence to person or property were used to the appellant, but he swore that he 'was afraid, because of what the respondent had said, that he would lose his work, and would not get employment anywhere where the Amalgamated Society predominated numerically over his own society.' These are the whole of the material facts, and on these facts the magistrate dismissed the summons. and we think rightly. The summons was issued, as already stated, under 38 and 39 Vict, chap 86, sec. 7. The third section of the Act distinctly legalizes strikes in the broadest terms, subject to the exceptions enumerated in the fourth and fifth sections which immediately follow, and are almost in the nature of provisoes upon the third. The sixth section is alien from the present question, and then comes the seventh, upon which we have to decide. It is true that the Act before us is one of a series of Acts dealing with subjects the same as or cognate to those dealt with in the Act itself. Many of these are expressly repealed by the 17th section, and amongst them 34 and 35 Vict., cap. 32, is wholly repealed. The Act, 34 and 35 Vict., cap. 32, was passed in 1871, after the charge to the jury by the present Lord Bramwell in 'The Queen *v.* Druitt' (10 Cox, 592, 601, 602), which was in 1867. Whether the Act was produced by the charge it is profitless to inquire. The last proviso of the first section is plainly inconsistent with the charge, and still more inconsistent with the language of Mr. Justice Compton and Mr. Justice Hill,

who, in 'Hilton *v.* Eckersley' and 'Walsly *v.* Anley' (30 L. J. (M. C.) 121), had the one declared and the other suggested that strikes were *per se* criminal at common law, and still further with the somewhat rhetorical language of Sir William Erle, who describes a strike as 'the power of evil in remorseless activity, destroying those relations between employers and employed on which comfort and peace depend, bringing guilt and misery on the workmen and ruin on their employers.' ('Erle on Trade Unions,' page 85.) The statute of 34 and 35 Vict, cap. 32. is not, indeed, conceived in any weak spirit of tenderness to workmen, but the second sub-section of the first section limits 'intimidation' in that sub-section to such intimidation as would justify a magistrate in binding over the intimidator to keep the peace towards the persons intimidated ; in other words, to such intimidation as implies a threat of personal violence. Of such intimidation there is in this case no evidence whatever, but it is truly said that this statute is repealed, and is of importance only so far as its object and language may throw light upon the existing statute, the statute under which the summons was issued. It seems clear, however, that, looking at the course of legislation and keeping in mind the changing temper of the times on this subject, the word 'intimidate' in the seventh section of the later Act cannot reasonably be construed in a wider or severer sense than the same word in the second sub-section of the first section of the earlier Act. 'Intimidate' is not, as has been often said by judges of authority, 'a term of art ;' it is a word of common speech and everyday use, and it must receive, therefore, a reasonable and sensible construction according to the circumstances of the cases as they arise from time to time. We do not propose to attempt an exhaustive definition of the word nor a complete enumeration of the cases to which it may be properly or improperly applied It is enough for us to say that in this case it appears to us all that there was nothing which, under any reasonable construction of the word 'intimidate,' could be brought within it. Whether the action of the Amalgamated Society was morally right or not is a matter on which we express no opinion because it is not the question before us. It seems to us that it was not illegal within the words of the Act of Parliament under which the summons was issued. This, however, does not entirely dispose of the question, for we were very properly reminded of the cases of 'The Queen *v* Burns' (12 Cox, 316, 339, 340), in which Lord Bramwell and Lord Esher are both said to have held that the statutes on the subject have in no way interfered with or altered the common law, and that strikes and combinations expressly legalized by statute may yet be treated as indictable conspiracies at common law and may be punished by imprisonment with hard labor. Neither of these cases is very satisfactorily reported ; in neither was there any motive for questioning the *dicta* of the judges. In the one tried by Lord Esher (then Mr. Justice Brett) there was no opportunity in consequence of the prisoner having been acquitted on all the counts to which the alleged ruling applied, and in the other case the prisoner was merely put under recognizances to appear if called upon to receive sentence, and so had no motive to question the judgment. We are well aware of the great authority of the judges by whom the above cases were tried, but we are unable to concur in these *dicta*, and speaking with all deference, we think they are not law. It seems to us that to hold that the very same Acts which are expressly legalized by statute remain nevertheless crimes punishable by the comman law is contrary to good sense and elementary principle, and that the reports, therefore, cannot be correct. If the *dicta* are law they render the statutes inoperative, and the statutes might as well not have been passed. The *dicta* are criticised in detail and with great ability in Mr. Justice Wright's excellent work on the law of criminal conspiracies, pages 50-59. It is difficult to withhold assent from the statements and reasonings contained in those pages, and it seems to us that the law concerning combinations in reference to trade disputes is contained in 38 and 39 Vict., cap. 86, and in the statutes referred to in it, and that acts which are not indictable under the statute are not, if indeed they ever were, indictable at common law."

Curran v. *Treleaven.*

"There remains to be considered the case of 'Curran *v.* Treleaven' in which the recorder of Plymouth affirmed a conviction by magistrates, who had convicted the secretaries of three trade unions in Plymouth for having intimidated Treleaven, a shipowner

in that town, within the meaning of 38 and 39 Vict., cap. 83, section 7, sub-section 1. The circumstances were very much like those in the last case on which we have just decided. In order to prevent the employment by Mr. Treleaven of non-union men, the three secretaries told him that if he did not cease to employ non-union men they would call off from their employment by him all the members of their respective unions Mr. Treleaven refused compliance with their demands, and thereupon the secretaries called off their respective union men, who in obedience to the call struck work. The facts are stated to us as follows by the learned recorder in the case which he has submitted to us. (His Lordship read passages therefrom to the effect he had stated). The learned recorder also states: 'The defendants did not desire or intend that any violence should be used, or that any injury should be done to Mr. Treleaven or his property, and it was not proved that their words or acts were calculated directly to cause any such violence or injury, though I am of opinion that Mr. Treleaven was not unreasonably afraid that such violence or injury may have occurred from the action of the members of the trade unions, and the consequent strike, against the wishes and intentions of the defendants. The defendants had no ill-will against Mr. Treleaven personally, but acted with the object of obliging all members of the union to abandon the work.' The recorder held, as the result of a very careful and able examination of the statutes and authorities, that the facts of the case did constitute intimidation within the words of the section, and that the men were properly convicted. We are unable to agree with him. As we have said, we do not propose to enter into an exhaustive enumeration of all the possible acts which do or do not constitute intimidation within the enactment. But we say that to tell an employer that if he employs workmen of a certain sort, the workmen of another sort in his employ will be told to leave him and to tell the men, when the employer will not give way, to leave their work, 'using no violence but quietly ceasing to work,' (we quote the language of the recorder) is certainly not intimidation within any reasonable construction of the statute Two further observations are necessary in order to make our judgment complete and effective. We do not think that the Legislature intended by the change of words in the 1st sub-section of the 7th section of 38 and 39 Vict., cap. 86, to send the courts back to 6 Geo. IV., cap. 129, for an interpretation of the word 'intimidate,' though the later statute did repeal 34 and 35 Vict., cap. 32, which limited intimidation to cases which would justify a magistrate in binding over the party to keep the peace. There is indeed much to be said for the view entertained by my brother Cave, and acted upon by him (as mentioned by the recorder in his judgment) in a case tried before him at Liverpool, namely, that intimidation in 38 and 39 Vict., cap. 86, must still be limited to threats of personal violence, as enacted by 34 and 35 Vict., cap. 32. It may become necessary to decide this point in time to come, it is not now, and we confine ourselves to the negative statement that 6 Geo. IV., cap. 129, is not now on this subject the governing statute. The other point is this: the recorder held that though an agreement to strike to benefit themselves would be now a lawful agreement, a strike which would have the effect of injuring an employer is illegal and indictable at common law. He cites in support of his view some phrases from the judgments of the Lords Justices in the case of the 'Mogul Steamship Company.' But with deference he has somewhat misapprehended the point of those observations. It is true that when the object is injury, if the injury be effected, an action will lie for the malicious conspiracy which has effected it, and therefore it may be that such a conspiracy, if it could be proved in fact, would be indictable. But it was pointed out in detail by the court of first instance that where the object is to benefit oneself it can seldom, perhaps never, be effected without some consequent loss or injury to someone else. In trade, in commerce, even in a profession, what is one man's gain is another man's loss, and where the object is not malicious, the mere fact that the effect is injurious does not make the agreement either illegal or actionable, and therefore such an agreement is not indictable. The recorder finds that there was no malice in fact, and this finding is inconsistent with the conclusion that the agreement was either criminal or unlawful. For these reasons we are of opinion that the judgment of the recorder cannot be sustained, but must be reversed and the conviction quashed."

CONCILIATION AND ARBITRATION.

The vast importance of conciliation and arbitration is most generally admitted in this day by all devoting any attention to the subject of labor disputes either in Great Britain, Australasia or on the Continent of America. Any scheme developing usefulness or practicability in this direction commends itself to the careful thought of those most immediately interested particularly, and hence it is considered advisable to reproduce the whole of Appendix III. of the "Report on the Strikes and Lockouts of 1890" (in Great Britain) by Mr. J. Burnett, Labor Correspondent of the Labor Department of the Imperial Board of Trade, bearing on the subject, as follows:

ENGLAND.

Labor Disputes and the London Chamber of Commerce.

The formation of the "London Conciliation Board" is the outcome of the joint efforts of the London Chamber of Commerce, as representing employers, and of various trade unions, on behalf of the employed. In 1889 the London Chamber of Commerce appointed a special committee to prepare a scheme of labor conciliation, which it provisionally adopted, and which was subsequently submitted to, and approved by, meetings of workingmen, to which the whole of the trade unions of the metropolis were invited to send representatives. A large number of these unions accordingly participated in the movement, which led up to the formation of the board; and the objects of its founders were thus set forth in the preamble of the first report of the Labor Conciliation Committee, which was adopted by the council of the chamber:

Preamble.

"It is advisable that the intentions of the chamber relative to the settlement of future labor disputes should be made public, and that the co-operation of employers of labor, and of trade unions, and other representative bodies of the working classes, should be earnestly solicited. It is inevitable that from time to time re-adjustments of the rates of labor should take place in sympathy with the fluctuating conditions of commerce and manufactures, and the London Chamber of Commerce fully recognized the moral as well as the legal right of both employers and employed to combine for the purpose of protecting their respective interests. But the chamber, in the interests of both classes, is most anxiously desirous that such adjustments should be brought about by amicable methods, and without the wasteful and calamitous occurrences of strikes and lockouts, which, in the case of the port of London, have been proved by sad experience to cause a diminution in the volume of trade, upon the continuance and increase of which the toiling masses of this metropolis depend for their daily bread."

Rules.

[*The following are the Rules which regulate "the London Conciliation Board" as adopted by the Council of the London Chamber of Commerce on the 6th February, 1890, as submitted to meetings of Trade Union Delegates, and as finally revised and adopted at the first meeting of the Board on December 12th, 1890.*]

I. That a permanent body be constituted, to be called "The London Conciliation Board," which shall be affiliated to the London Chamber of Commerce, and that its composition shall be as follows, viz.:

(*a*) Twelve members representing capital or employers, to be elected by the Council of the Chamber.

(*b*) Twelve members representing labor, to be elected by the employed.

(*c*) To these shall be added representatives from the separate trade conciliation committees, as hereinafter referred to.

(*d*) Four members, viz., the Lord Mayor of London, or some member of the corporation to be nominated by him, the Chairman of the London County Council, or some

member of the council to be nominated by him, and two representatives of London labor organizations to be selected by the labor representatives on the Board.

The formation of the Board shall date from its first meeting on December 12th, 1890. Its original members shall hold office for not exceeding three years as may have been or may be, from time to time, determined by the electing bodies respectively.

II. The duties of the London Conciliation Board shall be as follows:

(*a*) To promote amicable methods of settling labor disputes, and the prevention of strikes and lockouts generally, and also especially in the following methods:

1. They shall, in the first instance, invite both parties to the dispute to a friendly conference with each other, offering the rooms of the Chamber of Commerce as a convenient place of meeting. Members of the Board can be present at this conference, or otherwise, at the pleasure of the disputants.

2. In the event of the disputants not being able to arrive at a settlement between themselves, they shall be invited to lay their respective cases before the Board, with a view to receiving their advice, mediation or assistance. Or, should the disputants prefer it, the Board would assist them in selecting arbitrators, to whom the questions at issue might be submitted for decision.

3. The utmost efforts of the Board shall, in the meantime and in all cases, be exerted to prevent, if possible, the occurrence or continuance of a strike or lockout until after all attempts at conciliation shall have been exhausted.

The London Conciliation Board shall not constitute itself a body of arbitrators except at the express desire of both parties to a dispute, to be signified in writing, but shall, in preference, should other methods of conciliation fail, offer to assist the disputants in the selection of arbitrators chosen either from its own body or otherwise. Any dispute coming before the Board shall, in the first instance, be referred to a conciliation committee of the particular trade to which the disputants belong, should such a committee have been formed and affiliated to the chamber.

(*b*) To collect information as to the wages paid and other conditions of labor prevailing in other places where trades or industries similar to those of London are carried on, and especially as regards localities either in the United Kingdom or abroad where there is competition with the trade of London. Such information shall be especially placed at the disposal of any disputants who may seek the assistance of the London Conciliation Board.

III. The separate trade conciliation committees shall be composed of equal numbers of employers and of employed.

Each trade shall elect its own representatives, employers and employed voting separately for the election of their respective representatives. The number of members and the general rules of procedure shall be determined by each particular trade, subject to the approval of the London Conciliation Board.

The trade conciliation committee shall be affiliated to the London Chamber of Commerce, and shall be represented upon the London Conciliation Board. Any trade conciliation committee constituted as above, representing a body or trade in the metropolitan districts of more than one thousand imdividuals, shall send two representatives to sit on the London Conciliation Board, one being an employer and the other an operative workman, each to be separately elected by employers and employed respectively. In the case of trade conciliation committees representing bodies or trades in the metropolitan districts smaller in number than one thousand individuals, two or more such committees may unite together to elect joint representatives to the London Conciliation Board.

It shall be the duty of the trade conciliation committees to discus matters of contention in their respective trades; to endeavor amicably to arrange the same, and in general to promote the interests of their trade by discussion and mutual agreement. In the event of their not being able to arrange any particular dispute, they will refer the same to the London Conciliation Board, and in the meantime use their most strenuous endeavors to prevent any strike or lockout until after the London Conciliation Board shall have exhausted all reasonable means of settlement.

They may from time to time consider and report to the London Conciliation Board upon any matter affecting the interests of their particular trade, upon which it may be thought desirable to employ the action or influence of the London Chamber of Commerce as a body.

IV. The London Chamber of Commerce places its rooms at the disposition of the London Conciliation Board and of the trade conciliation committees for holding their meetings. Any alterations in the rules and regulations of these bodies which may be from time to time proposed shall be submitted for approval to the Council of the Chamber.

V. The above regulations shall be subject to by-laws, to be specially framed for the purpose, and which shall be open to amendment as required from time to time, on agreement between the Council of the Chamber of Commerce and the London Conciliation Board.

BY-LAWS.

Trade Conciliation Committees.

1. Any trade carrying on its operations within the metropolis or in the port of London, or within a reasonable distance thereof, can form a conciliation committee of its own trade under the foregoing rules.

2. Each committee shall elect its own chairman, who may be either a member of the committee, or a person chosen from outside the committee. Should the chairman be a member of the committee, he shall not have a second or casting vote. If the committee, however, should elect a chairman not being a member of the committee, either as general chairman or to preside on any special occasion, he shall not vote with the committee, and the committee shall decide at the time of his election whether he shall have a casting vote or otherwise. The committee shall also elect a vice-chairman, who shall, in the absence of the chairman, exercise the same power as the chairman.

3. In the event of any question being put to the vote at any meeting where the number of representatives of the employers and employed shall not happen to be equal, any member present shall have the right to claim that the voting power of each order shall be equal, irrespective of the numbers present. In this case the chairman shall call upon the order whose numbers predominate to exclude from the voting such a number of their order for the time being as shall suffice to produce an equality of voting between the two orders, the chairman counting himself as one of the order to which he belongs.

4. A quorum shall consist of not less than one-third of each order.

LONDON CONCILIATION BOARD.

5. The Board shall elect its own chairman and vice-chairman, who shall vote with the Board, but shall not have a second or casting vote.

6. The regulations of by-law 3, as laid down for the guidance of the trade conciliation committees, shall also apply to the London Conciliation Board.

7. The chairman shall be selected from the employers of labor on the board, and the vice-chairman from amongst the employed.

Meetings were held on the 16th of April, 4th of June, and the 29th of October, 1890, in addition to meetings to which all the unions comprised in 12 groups of trades were convened, to arrange for the election of workingmen representatives on the proposed London Conciliation Board.

At the meeting on the 16th of April the following alternative methods of election were suggested:

(*a*) For the meeting to proceed at once to the election of 12 representatives, each candidate being separately nominated, seconded, and voted for; or

(*b*) For the meeting to select 12 trades or groups of trades, to whose organized bodies shall be referred the election of the representatives, one for each group.

After considerable discussion with reference to the scheme, the following resolutions were adopted:

(1) "That this meeting adopt the method of election in proposition *b*, viz: to select 12 trades or groups of trades on the London Conciliation Board."

(2) "That a committee of 11 of the delegates here present be appointed to select the 12 groups of trades to form the London Conciliation Board"

The committee of selection subsequently met on the 24th of April and 2nd of May, and recommended to a meeting held on the 4th of June, 1890, (the whole of the trade unions of London being again invited to send delegates) that the 12 groups of trades should be thus subdivided:

1. Building trades. 2. Cabinet and furnishing trades. 3. Carmen, coach, train and 'bus employees. 4. Clerks, shop assistants and warehousemen. 5. Clothing trades. 6. Gas, coal, and chemical trades 7. Leather trades. 8 Metal trades. 9. Printing and paper trades. 10. Provision and food trades. 11. Railway workers. 12. Shipping trades.

[Forty-eight unions and other trade organizations, up to the end of 1890, took part in delegate meetings in connection with the formation of the London Conciliation Board.]

Record of Work done by the Board since its Formation.

The formation of the London Conciliation Board was the result of prolonged efforts and negotiations undertaken on behalf of the Council of the London Chamber of Commerce by a committee appointed for that purpose.

The Board did not assume its final shape, as far as regards actual organization, until the spring of this year, although the organizing committee was appointed in 1890. So soon, however, as the organizing committee had so far established its basis of operation as to secure the approval of the Council of the Chamber for the main principles of its scheme, it was authorized by the council to undertake the adjustment of such disputes as might be brought before it, pending the completion of its organization.

The following brief resume of the principle cases with which it had to deal will comprise disputes settled both by the provisional committee, and the provisional committee and the fully constituted Board, as in some instances the negotiations have been continuous, and it would be difficult to separate the work of the two bodies.

One of the first steps taken by the provisional organizing committee of the London Chamber of Commerce, on the adoption of their scheme by the Council of the Chamber, was to arrange a meeting between representatives of the Wharfingers and the Dock Laborers' Union, with reference more especially to the dispute at Hay's Wharf. This meeting took place on the 8th February, 1890, but though there was a lengthy interchange of views, no specific agreement was come to. In their next effort, however, the committee were completely successful, as they were able to effect the settlement of the differences between the proprietors of Oliver's Wharf and the Dock Laborers' Union on the 28th February, 1890.

An agreement was duly executed under the auspices of the committee by which the representatives of the men acknowledged that they were wrong in "going out as they did" and the proprietors of the wharf agreed to take back a number of men into their employment. The committee were next asked to bring together representatives of the Tailors' Pressers and Machinists' Union and representatives of the master tailors to discuss differences, and, if possible, avert an impending strike. Both parties met at the offices of the chamber on the 25th of February, 1890, but at the last moment, owing to the masters objecting to one of the workingmen delegates, the negotiations fell through. At the request of the Medway cement manufacturers, the committee were next asked to interfere in the dispute between them and the Bargemen and Watermen's Union, with the satisfactory result that after two prolonged sittings on the 18th and 25th of March, 1890, all the points in dispute were settled, apparently to the satisfaction of both sides. The settlement arranged included a long list of rates for the carriage of various articles, and had the immediate effect of preventing several thousand men being thrown out of employment. After working satisfactorily for upwards of eighteen months, certain points were in the first instance raised by the Medway bargemen, and negotiations proceeded through the Board with their employers, the cement manufacturers, which resulted in a meeting being held, over which a member of the Board, Mr. Walter Leaf, presided,

with the result that a new and revised list of freights was drawn up and agreed to by the employers and the men, which is now in actual operation. This arrangement was carried out as recently as October, 1891, and illustrates the practical value of the Board's rule under which parties to a dispute are invited to meet together in the first instance to adjust their disputes, recourse only being had to the Board's services in the event of disagreement.

Another case submitted was a dispute between Messrs. John Brinsmead and Sons, pianoforte manufacturers, and their French polishers, and the executive officers of the Amalgamated Union of French Polishers. The parties signed an agreement of reference under which they bound themselves to abide by the award of the Labor Conciliation Committee, the main point at issue being whether payment should be by the day or by the piece. The award was duly made, and has since been respected by both parties who are expressly required under its provisions to submit any further questions that may arise thereunder to the settlement of the London Conciliation Board. In a number of instances, at the request of one of the parties to a dispute, the Board has used its influence in endeavoring to bring about a meeting between them, and has otherwise acted so as "to promote amicable methods of settling labor disputes and the prevention of strikes and lockouts." At the last meeting of the Board a "new departure" was taken in its policy. In the event of a strike or lockout, instead of acting only on the request of one or both of the parties as heretofore, the Board will in future take the initiative in offering its assistance or mediation to both parties in adjusting their differences at an early stage.

The Amalgamated Society of Watermen and Lightermen of the River Thames, who had joined the scheme of the London Conciliation Board at an early stage of the movement, had a dispute with Messrs. Francis and Company, Limited, cement manufacturers of Cliffe and Vauxhall Bridge. They agreed to submit certain questions in difference between them to arbitration, with special regard to the wages paid to men employed in working resident dumb craft. The case was heard in February last by the arbitrators appointed by the Board, three representing the employers and three the employed. The award was made and communicated to the parties before they left the building, and the decision thus arrived at was a very important one as being the first case submitted to regular arbitration under the completed scheme.

The Board adopted the course of offering its services to the parties concerned in the strike at the Thames Ironworks, which has now terminated.

In regard to the strike in the building trade its offer to act was accepted by the the workmen, though not by the employers. The ultimate decision to accept the arbitration of the Institute of British Architects, nevertheless, is satisfactory to the Board as bringing about the settlement towards which efforts have been directed. The Secretary of the Building Trades Workmen's Committee (Mr. G. Dew) has been a member of the London Conciliation Board since its formation, and also acted as chairman of the trade union committee which made arrangements for the selection of labor representatives thereon. Mr. Stanley Bird, the Honorary Secretary of the Employers' Association, is also a member of the London Conciliation Board, and the influence both of that gentleman and Mr. Dew may be fairly claimed as having been exerted in the direction of conciliation.

The Board also offered its services in connection with the strike at the Carron and Hermitage Wharves. In the latter case the offer of the Board was courteously acknowledged, but was neither accepted nor declined by either party to the dispute.

For several months during 1891 negotiations have been proceeding between the bookbinders' trade section of the London Chamber of Commerce and the representatives of the Amalgamated Bookbinding Trade Unions, which have resulted in the adoption of an eight hours' day throughout the trade, subject to the conditions of an agreement which was finally arrived at and ratified by both parties on the 30th October, 1891. No less than five conferences took place between the employers and the men, nine of each order being present on every occasion. Here again the Board is gratified to know that the principle of friendly conference between the parties, in the first instance, has been observed, and

although the matter was not formally referred to the arbitrament of the Board, its secretary and assistant secretary respectively acted as chairmen of the various conferences, and it may be further noted that the by-laws of the bookbinders' trade section of the London Chamber of Commerce contain the following: "That in the event of labor disputes arising which cannot be arranged by the committee of the section, the disputants be invited to a friendly conference with each other in the rooms of the Chamber, under the regulations of the London Conciliation Board."

As an instance of the progress of the conciliation movement contemporaneously with the formation and operation of the London Board, it may be mentioned that the London Society of Compositors and other unions representing workingmen in the printing trade, made a demand for higher wages which would have resulted in a serious strike but for the willingness of employers and employed to meet together to discuss the whole matter. Several conferences took place at Stationers' Hall, and as a result an arrangement was arrived at. It is interesting to add that two gentlemen who were prominently concerned on the employers' side, viz, Mr. H. O. Arnold Foster and Mr. W. C. Knight Clowes, were amongst the pioneers of the conciliation movement, the former having been a member of the provisional organizing labor conciliation committee of the London Chamber of Commerce and the latter being now a member of the London Conciliation Board itself. The whole matter was carried through on the lines advocated by the Board, and always pursued whenever any labor dispute is brought under notice.

Another movement in which the London Chamber of Commerce and the London Conciliation Board have been in active sympathy, although they have not actually participated in it, was the formation of a board of conciliation for the boot and shoe trades, in connection with which serious difficulties were recently experienced, but the ultimate decision to abide by the award of the Board is, in itself, a testimony of its practical utility.

In addition to taking a direct part in the settlement of labor disputes, the Board has at all times done all in its power to further the conciliation movement throughout the country, a number of similar bodies having been formed more or less directly through its advocacy. Effect is given to that part of the Board's scheme which provides for the arrangement of trade conciliation committees as committees of the following have already been formed: Textile furnishing, musical instrument makers, engineering, printing and allies, and bookbinding trades on behalf of the employers, and bargemen and lightermen, coal, milling and carmen's union on the employees' side.

These are the most important instances of the Board's action, but its efforts are almost unceasing, as applications are continually being made and arrangements arrived at with a view to preventing strikes and lockouts. Everything points to the future development of the conciliation movement. No less than sixty unions are now more or less connected with the Board, having accepted its principles by sending delegates to its various meetings, by means of which they are brought into contact with employers of labor, and a mutual good feeling between both orders has been promoted and encouraged.

In other cases the Board has been instrumental in restoring employees to work which they had temporarily lost, in consequence of trade disputes. The Board sincerely believes and hopes that its work, besides the tangible results which are referred to above, has had a useful and educational effect, inasmuch as employers and employed have been encouraged to meet together for the discussion of questions connected with their interests in the labor market.

List of Other Boards of Conciliation and Arbitration.

London Conciliation Board, Liverpool Conciliation Board, Middlesborough Board of Conciliation and Arbitration, Staffordshire Potteries Board of Conciliation and Arbitration, Wolverhampton and District Conciliation Board, Boot and Shoe Trade Conciliation Board, as well as Conciliation Boards in Aberdeen, Dublin, Greenock, Bradford, Edinburgh, Leeds, Rochdale, Hull, Derby, Gloucester, Cardiff, Dundee, Nottingham, Glasgow, Manchester, Worcester, Walsall, Exeter, Plymouth and Morley.

UNITED STATES OF AMERICA.

NEW YORK.

In 1887 the people of the State of New York represented in the Senate and Assembly enacted a law intituled :

"An Act to provide for the amicable adjustment of grievances and disputes that may arise between employers and employees, and to authorize the creation of a State Board of Mediation and Arbitration."

SECTION 1. Whenever any grievance or dispute of any nature shall arise between any employer and his employees, it shall be lawful to submit the same in writing to a board of arbitrators for hearing and settlement. Said board shall consist of three persons. When the employees concerned are members in good standing of any labor organization, which is represented by one or more delegates in a central body, the said body shall have power to designate one of said arbitrators, and the employer shall have power to designate one other of said arbitrators, and the two said arbitrators shall designate a third person as arbitrator, who shall be chairman of the board. In case the employees concerned in any grievance or dispute are members in good standing of a labor organization which is not represented in a central body, then the organization of which they are members shall have the power to select and designate one arbitrator for said board, and said board shall be organized as hereinbefore provided. And in case the employees concerned in any grievance or dispute are not members of any labor organization, then a majority of said employees, at a meeting duly held for that purpose, shall designate one arbitrator for said board, and the said board shall be organized as hereinbefore provided. In all cases of arbitration the grievance or matter of dispute shall be succinctly and clearly stated in writing, signed by the parties to the arbitration or some duly authorized person on their behalf, and submitted to such board of arbitration.

SECTION 2. Each arbitrator so selected shall sign a consent to act as such, and shall take and subscribe an oath before an officer duly authorized to administer oaths, to faithfully and impartially discharge his duties as such arbitrator, which consent and oath may be filed in the office of the clerk of the county where such dispute arises. When the said board is ready for the transaction of business it shall select one of its number to act as secretary, and the parties to the dispute shall receive notice of time and place of hearing. The chairman shall have power to administer oaths and to issue subpœnas for the production of books and papers, and for the attendance of witnesses, to the same extent that such power is possessed by the courts of record or the judges thereof in this State. The board may make and enforce the rules for its government and the transaction of the business before it, and fix its sessions and adjournment, and shall hear and examine such witnesses as may be brought before the board, and such other proof as may be given relative to the matter in dispute.

SECTION 3. After the matter has been fully heard, the said board, or a majority of its members, shall, within ten days, render a decision thereon in writing, signed by them, giving such details as will clearly show the nature of the decision and the points disposed of. Such a decision shall be a settlement of the matter referred to said arbitrators unless an appeal is taken therefrom as is hereinafter provided. The decision shall be in duplicate, one copy of which shall be filed in the office of the clerk of the county, and the other transmitted to the Secretary of the State Board of Mediation and Arbitration hereinafter mentioned, together with the testimony taken before said board.

SECTION 4. When the said board shall have rendered its decision its power shall cease, unless there may be in existence at the time other similar grievances or disputes between the same classes of persons, and in such case such persons may submit their differences to the said board, which shall have power to act, and arbitrate and decide upon the same as fully as if said board was originally created for the settlement of such other difference of differences.

SECTION 5. Within three days after the passage of this Act the governor shall, with the advice and consent of the Senate, appoint a State Board of Mediation and Arbitration, to consist of three competent persons, each of whom shall hold office for the term of

three years, to commence immediately upon the expiration of the term of office of the members of the present State Board of Mediation and Arbitration, created under chapter four hundred and ten of the laws of eighteen hundred and eighty-six. One of the said persons shall be selected from the party which at the last general election cast the greatest number of votes for Governor of this State, and one of said persons shall be selected from the party which at the last general election cast the next greatest number of votes for Governor of this State, and the other of said persons shall be selected from a *bona fide* labor organization of this State. If any vacancy happens by resignation or otherwise, he shall in the same manner appoint an arbitrator for the residue of the term. If the Senate shall not be in session at the time any vacancy shall occur or exist, the governor shall appoint an arbitrator to fill the vacancy, subject to the approval of the Senate when convened. Said board shall have a clerk or secretary, who shall be appointed by the board to serve three years, whose duty it shall be to keep a full and faithful record of the proceedings of the board, and also all documents and testimony forwarded by the local boards of arbitration, and perform such other duties as the said board may prescribe. He shall have power under the direction of the board, to issue subpœnas, to administer oaths in all cases before said board, to call for and examine books, papers and documents of any parties to the controversy, and with the same authority to enforce their production as is possessed by the courts of record or the judges thereof in this State. Such arbitrators and clerk shall take and subscribe the constitutional oath of office, and be sworn to the due and faithful performance of the duties of their respective offices before entering upon the discharge of the same. An office shall be set apart in the capitol by the person or persons having charge thereof for the proper and convenient transaction of the business of said board.

Section 6. An appeal may be taken from the decision of any local board of arbitration within ten days after the rendition and filing of such decision. It shall be the duty of said State Board of Mediation and Arbitration to hear and consider appeals from the decisions of local boards, and promptly to proceed to the investigation of such cases, and the decision of said board thereon shall be final and conclusive in the premises upon both parties to the arbitration. Such decision shall be in writing, and a copy thereof shall be furnished to each party. Any two of the arbitrators shall constitute a quorum for the transaction of business, and may hold meetings at any time or place within the State. Examinations or investigations ordered by the board may be held and taken by and before any one of their number, if so directed. But the proceedings and decision of any single arbitrator shall not be deemed conclusive until approved by the board or a majority thereof. Each arbitrator shall have power to administer oaths.

Section 7. Whenever any grievance or dispute of any nature shall arise between any employer and his employees, it shall be lawful for the parties to submit the same directly to said State Board in the first instance, in case such parties elect to do so, and shall jointly notify said board or its clerk in writing of such election. Whenever such notification to said board or its clerk is given, it shall be the duty of said board to proceed, with as little delay as possible, to the locality of such grievance or dispute and inquire into the cause or causes of grievance or dispute. The parties to the grievance or dispute shall thereupon submit to said board in writing succinctly, clearly and in detail, their grievances and complaints, and the cause or causes thereof, and severally agree in writing to submit to the decision of said board as to matters so submitted, and a promise or agreement to continue on in business or at work without a lockout or strike until the decision of said board, provided it shall be rendered within ten days after the completion of the investigation. The board shall thereupon proceed to fully investigate and inquire into the matters in controversy, and to take testimony under oath in relation thereto, and shall have power, by its chairman or clerk, to administer oaths, to issue subpœnas for the attendance of witnesses, the production of books and papers, to the same extent as such power is possessed by the courts of record or the judges thereof in this State.

Section 8. After the matter has been fully heard the said board, or a majority of its members shall, within ten days, render a decision thereon in writing, signed by them, or a majority of them, stating such details as will clearly show the nature of the decision

and the points disposed of by them. The decision shall be in triplicate, one copy of which shall be filed by the clerk of the board in the clerk's office of the county where the controversy arose, and one copy shall be served on each of the parties to the controversy.

SECTION 9. Whenever a strike or lockout shall occur, or is seriously threatened in any part of the State, and shall come to the knowledge of the board, it shall be its duty, and it is hereby directed to proceed, as soon as practicable, to the locality of such strike or lockout, and put themselves in communication with the parties to the controversy, and endeavor by mediation to effect an amicable settlement of such controversy; and if in their judgment it is deemed best to inquire into the cause or causes of the controversy, and to that end the board is hereby authorized to subpœna witnesses, compel their attendance, and send for persons and papers, in like manner and with the same powers as it is authorized to do by section seven of this Act.

SECTION 10. The fees of witnesses shall be fifty cents for each day's attendance, and four cents per mile travelled by the nearest route in getting to or returning from the place where attendance is required by the board. All subpœnas shall be signed by the Secretary of the Board, and may be served by any person of full age authorized by the board to serve the same.

SECTION 11. Said board shall make a yearly report to the legislature, and shall include therein such statements, facts and explanations as will disclose the actual working of the board, and such suggestions as to legislation as may seem to them conducive to harmonizing the relations of and disputes between employers and the wage-earning masses, and the improvement of the present system of production.

SECTION 12. Each arbitrator shall be entitled to an annual salary of three thousand dollars, payable in quarterly instalments from the treasury of the State. The clerk or secretary shall receive an annual salary of two thousand dollars, payable in like manner.

SECTION 13. Whenever the term "employer" or "employee" is used in this Act it shall be held to include "firm," "joint stock association," "company" or "corporation," as fully as if each of the last-named terms were expressed in each place.

SECTION 14. This Act shall take effect immediately.

PENNSYLVANIA.

In April, 1893, the House of Representatives of the State of Pennsylvania, U.S.A., assented to the following law, viz.:

An Act to establish Boards of Arbitration to settle all questions of wages and other matters of variance between capital and labor.

Whereas the great industries of this Commonwealth are frequently suspended by strikes and lockouts, resulting at times in criminal violation of the law, and entailing upon the State vast expense to protect life and property and preserve the peace;

And whereas no adequate means exists for the adjustment of these issues between capital and labor, employers and employees, upon an equitable basis where each party can meet together upon terms of equality to settle the rates of compensation for labor and establish rules and regulations for their branches of industry in harmony with law and a generous public sentiment, therefore

SECTION 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same.

That whenever any differences arise between employers and employees in the mining, manufacturing or transportation industries of the Commonwealth, which cannot be, mutually settled to the satisfaction of a majority of all parties concerned, it shall be lawful for either party, or for both parties jointly, to make application to the Court of Common Pleas wherein the service is to be performed about which the dispute has arisen, to appoint and constitute a Board of Arbitration to consider, arrange and settle all matters at variance between them, which must be fully set forth in the application, such application to be in writing, and signed and duly acknowledged before a proper officer by the

representatives of the persons employed as workmen, or by the representatives of a firm, individual or corporation, or by both if the application is made jointly by the parties—such applicants to be citizens of the United States; and the said application shall be filed with the record of all proceedings had in consequence thereof among the records of said Court.

SECTION 2. That when the application, duly authenticated, has been presented to the Court of Common Pleas as aforesaid, it shall be lawful for said Court, if in its judgment the said application allege matters of sufficient importance to warrant the intervention of a Board of Arbitrators, in order to preserve the public peace or promote the interests and harmony of labor and capital, to grant a rule on each of the parties to the alleged controversy, where the application is made jointly, to select three citizens of the county, of good standing and familiar with all matters in dispute, to serve as members of the said Board of Arbitration, which shall consist of nine members, all citizens of this Commonwealth. As soon as the said members are appointed by the respective parties to the issue, the Court shall proceed at once to fill the board by the selection of three persons from the citizens of the county, of well known character for probity and general intelligence, and not directly connected with the interests of either party to the dispute, one of whom shall be designated by the said judge as president of the Board of Arbitration.

Where but one party makes application for the appointment of such Board of Arbitration the Court shall give notice by order of Court to both parties in interest requiring them each to appoint three persons as members of said board, within ten days thereafter, and in case either party refuse or neglects to make such appointment the Court shall thereupon fill the board by the selection of six persons who, with the three named by the ther party in the controversy, shall constitute said Board of Arbitration.

The said Court shall also appoint one of the members thereof secretary to the said board, who shall also have a vote and the same powers as any other member, and shall also designate the time and place of meeting of the said board. They shall also place before them copies of all papers and minutes of proceedings to the case or cases submitted to them.

SECTION 3. That when the Board of Arbitrators has been thus appointed and constituted, and each member has been sworn or affirmed, and the papers have been submitted to them, they shall first carefully consider the records before them and then determine the rules to govern their proceedings. They shall sit with closed doors until their organization is consummated, after which their proceedings shall be public. The president of the board shall have full authority to preserve order at the sessions, and may summon or appoint officers to assist; and in all ballotings he shall have a vote. It shall be lawful for him, at the request of any two members of the board, to send for persons, books and papers, and he shall have power to enforce their presence and to require them to testify in any matter before the board, and for any wilful failure to appear and testify before said board when requested by the said board, the person or persons so offending shall be guilty of a misdemeanor and on conviction thereof in the Court of Quarter Sessions of the county, where the offence is committed, shall be sentenced to pay a fine not exceeding five hundred dollars and imprisonment not exceeding thirty days, either or both at the discretion of the Court.

SECTION 4. That as soon as the board is organized the president shall announce that the sessions are opened and the variants may appear, with their attorneys and counsel, if they so desire, and open their case; and in all proceedings the applicant shall stand as plaintiff, but when the application is jointly made the employees shall stand as plaintiff in the case. Each party in turn shall be allowed a full and impartial hearing, and may examine experts and present models, drawings, statements and any proper matter bearing on the case, all of which shall be carefully considered by the said board in arriving at their conclusions, and the decision of the said board shall be final and conclusive of all matters brought before them for adjustment; and the said Board of Arbitration may adjourn from the place designated by the Court for holding its sessions when it deems it expedient to do so, to a place or places where the dispute arises, and hold sessions and personally examine the workings and matters at variance to assist their judgment.

Section 5. That the compensation of the members of the Board of Arbitration shall be as follows, to wit: Each shall receive four dollars per day and ten cents per mile both ways between their homes and the place of meeting by the nearest comfortable routes of travel, to be paid out of the treasury of the county where the arbitration is held: and witnesses shall be allowed from the treasury of the said county the same fees now allowed by law for similar services.

Section 6. That the Board of Arbitrators shall duly execute their decision, which shall be reached by a vote of a majority of all the members by having the names of those voting in the affirmative signed thereon, and attested by the secretary; and their decision together with all the papers and minutes of their proceedings shall be returned to and filed in the Court aforesaid for safe keeping

Section 7. All laws and parts of laws inconsistent with the provisions of this Act be and the same are hereby repealed.

NORTH DAKOTA.

The following is an Act providing for the establishment of Courts of Conciliation in North Dakota, and describing the Mode of Procedure in same.

Be it enacted by the Legislative Assembly of the State of North Dakota:

Election of Commissioners of Conciliation.

1. There shall be elected at the same time and in the same manner as the justices of the peace in each town, incorporated village and city, from the qualified voters thereof, four commissioners of conciliation whose term of office shall be two years and until their successors are duly elected and qualified. The time of commencement of their term of office shall be the same as that prescribed for justices of the peace.

Proceedings before Commissioners.

2. At the time of issuing the summons in any civil action begun before a justice of the peace, the justice shall issue a subpœna, summoning two of the commissioners of conciliation elected for the town, village or city where the action is brought, to appear before him at the time and place designated in the summons, which subpœna shall be served at least three days before the return day and in the same manner as a summons is required to be served in actions in the district court. If either party fails to appear at the time designated in the summons, judgment shall be entered against the party so failing to appear, as is now provided by statute. If both parties appear they shall then go before the justice and the two commissioners summoned, as aforesaid, and state their differences, which statements, or so much thereof as is necessary to show the issue between the parties, shall be reduced to writing by the justice and entered on his docket and shall constitute the pleadings in the case. The parties shall then introduce such evidence as they may think proper in the order and under the restrictions prescribed by the commissioners and justice. It shall be discretionary with the justice and commissioners whether or not the witnesses shall be sworn before testifying. After hearing and considering all the evidence offered it shall be the duty of the justice and commissioners to the best of their abilities to persuade the parties to agree to an amicable settlement of their differences on such terms as are just and equitable. If an agreement is reached it shall be entered by the justice in his docket in the form of a judgment signed by both parties, and shall be a judgment of the court of said justice. *Provided* that no agreement shall be entered unless it can be put in the form of a judgment now authorized by law to be entered by justices of the peace. At the hearing herein provided for, each party must appear in person or by an agent duly authorized in writing to appear. No attorney shall be allowed to appear or act in any proceeding for either of the parties or otherwise. If at such hearing the parties are not able to agree to an amicable settlement the case shall be adjourned for trial for such time as the justice shall designate, which shall not be less than one week, and the justice shall allow the parties such time as he may think proper in which to file amended pleadings. The action shall then proceed to trial and judgment as is now provided by law.

COMPENSATION OF COMMISSIONERS.

3. The commissioners shall receive the same mileage and per diem as is now paid to jurors. The fees of the commissioners, justice and officer shall be included in the settlement and paid by the party designated in the judgment. If a commissioner disobeys the subpœna of the justice he shall be proceeded against in the same manner as a juror who fails to appear when summoned.

PROCEEDINGS NOT EVIDENCE AT SUBSEQUENT TRIAL.

4. No part of the proceedings had before the justice and commissioners shall be admitted as evidence or considered at the trial of the case, nor shall the commissioners who took part in the hearing be allowed to testify.

Approved March 10th, 1893.

AUSTRALIA.

From the "Review of Reviews," September, 1892.

There has come to us from Australia a public document, which at any time would command attention by reason of its very great intrinsic interest and merit, but which possesses an extraordinary interest at the present moment in view of certain acute phases of the labor question that are agitating the public mind in the United States. The "Report of the Royal Commission on Strikes," published by the Government of New South Wales is issued in the form of a huge volume of about a thousand pages of about the same dimensions as the "Century Dictionary." So compendious is this canvas-bound tome that it seems to us a veritable library of information upon the world's experience in industrial disputes and attempts to remedy them.

THE GREAT STRIKE IN NEW SOUTH WALES.

The great strike of 1890, in New South Wales compelled the notice of the entire world. Sheep-raising being a principal industry in that portion of Australia, the strike of the Shearers' Union, on account of the introduction of non-union men, led to strikes of union men engaged in transportation industries, who refused to handle the wool shorn by non-union workers. The proportions of the strike grew until the coal-miners of the colony were involved, and until almost every kind of productive pursuit was brought into the controversy. Trade unions were highly organized, and were represented by a Trades and Labor Council, having headquarters at Sydney, and holding together the associations of different trades in a strong and effective federation. Employers, on the other hand, were bound together in an association which included the representatives of almost the entire mass of capital engaged in productive industries in the great colony of New South Wales. The struggle between these two powerful and determined bodies—the one representing almost the totality of the capital engaged in production and concerned with the employment of labor, and the other representing almost the entire body of men both skilled and unskilled who worked for wages in other than merely domestic relations—was well nigh as disastrous and paralyzing as a state of civil war. A better instance of complete deadlock, which is liable to result from a difference of opinion between modern federated trades unions and modern associations of capitalists and *entrepeneurs*, has never been witnessed anywhere. While not analogous in all details to the Homestead situation, the great strike in New South Wales was similar to the Pennsylvania struggle in most of its essential principles.

A COMMISSION ON STRIKES AND THEIR REMEDIES.

The injury wrought against the peace and prosperity of the colony was so serious that the Government found it expedient to appoint a Commission to investigate the entire subject of strikes and their remedies, for the purpose of making a report with recom-

mendation of measures to be pursued by the Parliament of New South Wales. The Commissioners were instructed "to investigate and report upon the causes of conflicts between capital and labor, known as 'strikes,' and the best means of preventing or mitigating the disastrous consequences of such occurrences; to consider from an economic point of examination the measures that have been devised in other countries by the constitution of Boards of Conciliation or other similar bodies to obviate extreme steps in trade disputes, and to consider and report upon the whole subject." The Commission was composed of Hon. Andrew Garran, LL D., as president, and of sixteen other gentlemen, half of whom were representatives of the employing interest and half were representatives of the labor unions. Mr. Percy R. Meggy, an experienced journalist, was made secretary of the Commission. The Commissioners held some fifty meetings, and made free use of their authority to summon witnesses. They also sought and obtained from the principal countries of the world such documents, reports and miscellaneous writings upon labor questions as would give them the benefit of a knowledge of the experience of Europe and America.

A Library of Economics in one Volume.

The huge volume that has been given to the public as the result of their labors is a monument to the earnestness and ability of the Commission and to the industry and skill of the secretary, Mr. Meggy. It contains, first, the summarized minutes of the fifty or more sessions of the Commission, then in about twelve pages the final report adopted and signed by the members. Next follows more than forty pages of small type containing what is entitled the "Conciliation Appendix." This conciliation appendix is a remarkable piece of work, including a summary of the principal schemes and public acts in different countries, dealing with conciliation or arbitration, which is followed by accounts of the French Courts of Conciliation, the English Arbitration Acts the experience of the United States in arbitration between capital and labor, the new industrial code of Germany, and the systems now in vogue in Denmark and Norway, Italy, Belgium and Austria. A large amount of space is also given to various bills and proposals pertaining to the different Australian colonies. More than four hundred pages are devoted to a verbatim report of the evidence taken by the Commission at the various sittings, accompanying which is a well digested precis of the great mass of information and opinion contained in the preceding minutes of evidence.

Next follows an appendix giving various acts and documents referred to in the testimony, and summarizing many important books upon labor and social questions. And this appendix is, taken as a whole, a most extraordinary compendium of particular information upon the progress of the labor movement in all lands. Finally, Mr. Meggy has given us more than a hundred large pages of what he entitles a "Literary Appendix." In this portion of his volume he has made abstracts of a great number of works upon labor questions, and has included a vast quantity of bibliographical references and documentary materials. Notwithstanding the comparatively short time allowed the Commission in which to arrive at its conclusions, and permitted the secretary, Mr. Meggy, for the compilation of his bibliographical materials, this volume must be pronounced one of the most remarkable and valuable contributions than has ever been made to the literature of social economics.

A Unanimous Conclusion Reached.

The report itself, which, as we have explained, occupies some twelve pages, is divided into thirty-three paragraphs. When one remembers the extreme agitation out of which grew the appointment of this Commission, and that in its membership both sides of the controversy were fully represented, the conclusions of the report are entitled to the highest consideration in view of the significant fact that each of the thirty three paragraphs was, after full and careful debate, adopted with absolute unanimity by the seventeen members. The report was drawn up in no merely local and temporizing spirit. It deals with the great struggle between capital and labor in a spirit broad enough to make its conclusions as applicable to Canada as they may be elsewhere. Some quotations from it are therefore evidently in order at this moment.

NATURE OF THE SOCIAL CONFLICT.

"As to the importance of the question submitted to the Commission there can be no two opinions It is undeniably the great social problem of the age. Even those who are least disposed to interfere between the contending forces, and who would prefer to leave the strike to settle itself admit that the industries of the Colony, and therefore its prosperity are seriously hampered by the disagreements between employers and employed. . . . The social conflict, as it exists, is generally spoken of as a conflict between labor and capital. To some extent, however, the capitalist stands outside the arena, though intensely interested in the issue. The exact antagonism is between the direct employer and the employed. Some employers work entirely on their own capital, and some joint stock companies do the same, and in those cases the employer and the capitalist are one. Some employers, especially those who are struggling upward, have very little capital of their own, but work largely on credit; and we may mention incidentally that quarrels over little points arise most frequently with small employers, to whom small gains are of proportionately greater importance than they are with large employers. The majority of employers in this colony lie between the two extremes. They have some capital of their own, and they borrow the rest from banks, finance companies or individual capitalists. . . . From the evidence it appears that until recent times the most frequent causes of strikes have been an effort to raise wages or to resist the reduction of wages, an effort to secure shorter working hours or to resist any covert or open increase of the hours of work, or claims for the intermission of labor for rest, or a demand to employ more hands for a given work, or to resist the discharge of men supposed to be punished for their positions in a trades union, or their prominent labors in connection with it. The last is especially in defence of the principles and practices of unionism. And this leads to the remark that at the present time more important than all the causes mentioned is that which is rapidly becoming the chief ground of contention between employers and employed —namely, the employment of non-unionists. It is clear that a very broad and important distinction is to be drawn between all those demands of the wage-getting class which directly affect their comfort and those which are put forth in defence of their labor organizations, and in assertion of their right to extend the operation of those unions and their confederation. . . . . .

HOW FEDERATION WIDENS THE AREA OF STRIFE.

"The federation of labor and the counter federation of employers," continues the Report, "is the characteristic feature of the labor question in the present epoch. A few years ago each union was an independent organization, though the sympathy between different trades was strong and showed itself repeatedly in the form of subscriptions to assist other trades when their members were on strike or were locked out. But now the union of men in a trade has developed into a union of different trades together, and practical sympathy has taken the form of aiding a strike by striking also. This, of course, has the effect of increasing the area of contest and of dragging into it persons not originally involved. It is obvious that there is no limit to this extension of any strife except the limit of the labor organizations themselves; and what the colony has already experienced in the way of suspension of industry is only a fraction of what it might possibly experience if a more general strike took place. The effect of this organization of labor has already been to draw all employers together. . . . The industrial community is thus being organized into two vast camps, jealous and suspicious of each other, and preparing for a possible conflict which, in a few months, may destroy the savings of many years. The extent to which this organization of employers and employed has now attained gives the whole question its present public and even its national importance.

CONCILIATION THE GREAT REMEDY.

The Report proceeds to explain that the distinctions to be observed in examining the cause of strikes are also to be observed in treating of their cure. Those disputes which grow out of the amount of wages and questions of similar import usually turn upon

differences of opinion which chiefly require that the real truth as to certain matters of fact should be reached. Says the Report:

"No better method of dispersing the mists that surround a controversy of the sort under our consideration can be found than a friendly conference. A very large experience has shown that the difficulty is often cleared up in this way and reduced to such dimensions as admit of a fairly satisfactory settlement. It is this experience which leads to the conclusion that the very first thing to be done in order to permit of the settlement of a labor dispute is to try the effect of conciliation.

"And in using this term 'conciliation' for the first time in this Report, it is convenient to remark here that the terms conciliation and arbitration are often employed somewhat vaguely, as if they were interchangeable, and yet they really represent two distinct things. The function of any conciliation agency is to get the parties to a dispute to come to a common agreement voluntarily without any opinion being pronounced on the merits or any instructions given. The function of arbitration is distinctly to determine the merits and to give a positive decision to be abided by. If the declaration of such a decision can be avoided it is well that it should be, because decisions are generally more or less adverse to both parties, for even splitting the difference is an equal censure upon both. But conciliation, if it is a success, allows of a friendly settlement on a mutual agreement, and leaves no opening for discrediting the understanding or the impartiality of the arbitrators."

There Should be a State Board.

Whereupon the Report proceeds to consider the practical question how this primary remedy of conciliation is to be applied. It points out the fact that, as respects different trades, particularly in England, Boards of Conciliation voluntarily established, have lasted for several years, have done good work and often very difficult work. But while admitting that conciliation may work very effectively through purely voluntary and non-official arrangements, the Commission finds that the work of conciliation would be greatly assisted if there were an established organization instituted by the State and always ready to be called into action by either of the parties to a dispute:

"The great weight of the testimony is distinctively to the effect that the existence of a State Board of Conciliation would have a wholesome and moderating effect. Such an institution, clothed with the authority of the State, would stand before the public as a mediatory influence always and immediately available, and public opinion would be averse to those who, except for very good cause shown, refused to avail themselves of its good offices."

Arbitration when Conciliation Fails.

But though in the majority of cases, continues the Report, disputes will be settled by the preliminary process of having them thoroughly sifted before a Board of Conciliation, there will remain some cases in which, dispite all explanation and mediation, there will survive an irreducible residuum. It does not follow, however, holds the Commission, that the task of settling the dispute must be abandoned at that point. The experience hitherto gained goes to show that this need not be:

"Either under the term 'conciliation' or under the term 'arbitration' Boards have to a very large extent been empowered to give decisions, that is to say, have practically exercised a judicial function. When conciliation has failed, then is the time for arbitration to begin. . . . In the immense majority of cases, both in France and England, the decisions given have been reasonably equitable, and have served to settle the dispute until circumstances altered and raised the same or a similar question again. It is impossible to resist the moral effect of the vast body of evidence which exists on this point. It is a demonstrated fact that decisions can be given as to industrial disputes which practically solve the immediate difficulty."

A Single Board for both Functions.

The Report next proceeds to consider the question whether, in the event of a failure on the part of the Board of Conciliation to effect a settlement of the dispute, the next

step—that of arbitration—shall be undertaken by a separate boar or body, or whether the arbitrators shall themselves be the persons who have been engaged in the attempt to effect a conciliation. The Commissioners discussed this question broadly, and came to the conclusion that there should be only one board, "but that this one board should be empowered in some form to discharge, as occasion may require, the double duty of conciliation and arbitration. That is to say, that its first effort should be toward bringing about a voluntary agreement between the parties, and failing that, that the board, or the permanent part of it, should discharge the duty of adjudication and pronounce a decision." And this view leads at once to the question how the board shall be constituted.

Constitution and Working of the Board.

The Report demonstrates the necessity that the board shall be a representative one. That is to say, that it should contain persons sympathizing with the two interests involved.

The result of a consideration given to arbitration and conciliation schemes in various countries leads the Commissioners to the unanimous conclusion that there should be a standing board of conciliation to which, in the case of ever dispute, there should be added members selected by the two parties in the particular controversy, who should sit with the permanent part of the board during the period of the attempt to accomplish a solution by the process of voluntary conciliation. But if a complete agreement should not be reached by conciliation, then such points as remained unadjusted should be referred to the permanent part of the tribunal, which should then resolve itself into a Court of Arbitration. This permanent part should consist of a chairman appointed by the Governor, and of an equal number of members—two or more—to be selected by their own class as representing employers on the one hand and employees on the other.

The State's Interest in the Maintenance of Industrial Peace.

It is not regarded by the Commission as in any wise desirable to force such a State Board of Conciliation and Arbitration into every trade or labor dispute that arises, and it emphasizes the desirability of private agreements and arrangements in particular trades, which should lead to a better understanding of the mutual relations of employers and employed.

"Private conferences, private efforts at conciliation, may fittingly take place in any or every trade, but the advantage of a State board is that it is there, always in existence, to deal with any case that has proved too obstinate for private settlement. All disputes should, if possible, be settled within the trade itself, and there would be the greater probability of this being done if it were known that, failing a settlement, either party could force the case before the State Board of Conciliation."

Upon the question of the expense of maintaining State Boards of Conciliation, the Commissioners make some very pertinent remarks:

"We have said that we have not neglected the question of economy, but at the same time we do not think that a rigid economy should be a ruling consideration in dealing with the constitution of a trades' tribunal, for the loss to the community at large from a great and prolonged strike is immeasurably greater than the cost of any conciliation tribunal. What the loss to the country from the late strike was, it is difficult to estimate. To the Government alone in its various departments it was very great, while in the loss of trade, in the depreciation of investments and in the discouragement of industry it was very much greater still. Any reasonable expense should be cheerfully encountered if by so doing these disastrous social conflicts could be prevented."

Arbitration Compulsory upon the Demand of one Party.

The twenty-seventh paragraph of the Report deals so temperately and wisely with the question of compulsion in the initiation of an attempt to settle industrial difficulties by arbitration that we shall quote it in its entirety, and we must again remind our readers that its great significance lies in its unanimous adoption by a Commission composed equally of employers and employed:

"We have given careful attention to the question as to whether the tribunal we propose shall have any compulsory powers. This question has to be considered on two sides: First, whether there should be compulsion in initiating the action of the board, and second, whether there should be compulsion in enforcing the decrees of the court. As to the first point, *we do not reject the doctrine that the State may legitimately interfere to prevent such colossal disputes as have already distracted our society and are threatening to distract it still more. Looking at the laws as they exist now for the prevention of disturbances and for forbidding incitement to disorder, it can hardly be contended that disputes which almost assume the character of civil war ought to lie outside the cognizance of the guardians of the public peace.* But we do not propose at present any such extension of principles already recognized as to give to the State Board of Conciliation a right to insist on both parties to a trade dispute bringing their case before it. It may, under conceivable circumstances, become expedient hereafter to give such powers; but the expediency should first be clearly proved. In establishing a tribunal for settling disputes that are not in themselves criminal, we think it best that the State agency should be called into action rather than act of itself. But admitting this, the question still arises whether, if one party to the dispute calls for the action of the board, it should proceed to take such action, even if the other party stands aloof. And here we are of opinion that it should not be necessary for both parties to call upon the board to interfere, as to adopt this course would be to very greatly limit the usefulness of the board. It is true, that to allow one party to set the board in motion would be, to a certain extent, to put compulsion on the other party, because it must either appear or run the risk of having an award given in its absence. But this degree of compulsion is in the public interest clearly expedient. No quarrel should be allowed to fester if either party were willing to accept a settlement by the State tribunal. Industrial quarrels cannot continue without the risk of their growing to dangerous dimensions, and the State has a right in the public interest to call upon all who are protected by the laws to conform to any provision the law may establish for settling quarrels dangerous to the public peace. We may mention in support of this view, that we have already some pertinent and valuable experience. The Newcastle (New South Wales) agreement, which represents the matured experience of the colliery proprietors and of a compact body of 5,000 coal-miners, provides that differences that cannot be settled out of the court may be submitted to a referee, and that either party may set the court in motion. Five cases have hitherto been submitted, the miners having in each case taken the initiative, the masters coming into court to defend their position."

Should there be Compulsion as to the Award.

Furthermore, section twenty-eight, which discusses the propriety of compulsion in the enforcement of the award or decision of an arbitration court, is so valuable a contribution to the discussion of the subject that we are also constrained to quote the entire paragraph. It is as follows:

"The second point is, how far compulsion should be applied at the close of the arbitration process. Should there be any power to enforce awards, or to inflict fines and penalties for non-compliance? Most of the legal witnesses are in favor of such a compulsion, on the ground that a court that cannot enforce its award is not worthy of existence. But it should be remembered that a court of arbitration is not like an ordinary court of law. There is no fixed code of law which it interprets, and its decision is only a declaratory statement as to what it thinks just and expedient. Neither party to the suit has been breaking the law, and the decision asked for is not, as in a court of law, what is the law in the case, but what is the justice, or the wisdom, or the expediency of the case. In England it was for many years the law that justices of the peace should assess wages, and under such a state of things it was appropriate that there should be fines and penalties for disobedience to the constituted authorities. It has been said that if an arbitration court cannot compel obedience to its decisions it will be useless. The answer to this is that experience is, though not wholly, almost wholly the other way. In England all the trade arbitrations have been outside the law, because the three laws passed for the purpose have been inoperative. And yet, though arbitrations have been very numerous, the cases are very few in which the decisions have not been loyally accepted. The reason of this is

that the decisions have been reasonably fair, and both parties to the suit have felt that it was better to acquiesce in a decision with which they were not wholly contented than to prolong the strife. Public opinion, too, which counts for a great deal in matters of this kind, is always in favor of acquiescing in a decision given after a fair hearing. There is every reason to expect that in the very great majority of cases the decisions of arbitrators will settle the dispute, and it is not worth while, therefore, for the sake of making compliance universal to introduce the repugnant element of compulsion. Moreover, as has been pointed out by witnesses on both sides, although a court of arbitration might inflict fines and penalties, it could not compel men to work for less wages than they were contented with, because they could all give their legal notice and quit their occupation; nor could an employer be compelled to keep on his business for a lower rate of profit than would, in his judgment, compensate him for his risk and trouble. The law cannot prevent him from refusing to take any new business and closing his establishment. It may be added that the absence of any external compulsion does not prevent the parties from putting compulsion on themselves. All who want compulsion can have it. They can agree to a bond before going to arbitration that would give the right to sue a defaulter."

How the Commission's Plan would have worked at Homestead.

Obviously the question did not come before the New South Wales Commission whether or not certain great employing, transportation and industrial companies, which enjoy public franchises and charters, and whose operations assume a *quasi* public character, ought not to be compelled, as a condition of their corporate existence, to accept, so far as they themselves are concerned, the results found by a State court of arbitration in case of a dispute duly brought up for settlement. But it should be clearly perceived that in insisting upon the right of one party in controversy to set the State Board of Arbitration into action the Commission has in reality taken a long and valuable step in the direction of wise progress.

Let us suppose, for example, that the "Wallace Act," adopted by Pennsylvania in 1883, had empowered one party to secure the intervention of an arbitration court instead of making it necessary for both parties to consent, public opinion would have insisted that the Homestead men, in objecting to Mr. Frick's new scale after final failure to effect a reconciliation through private conference, should have made the demand authorized by law for the intervention of a court of arbitration to adjudicate the points in dispute. The award of such an arbitration, if rejected by the men who had asked for it and had set the court in motion, would certainly have insured the public condemnation of any subsequent attempt to conquer Mr. Frick by strike methods. And so clear and powerful would this public opinion against the strikers have been that their attempt would have been doomed to a quick and disastrous failure.

But, upon the other hand, if Mr. Frick had shown so little regard for the good order and peace of the community as to refuse to accept in good faith the decision rendered by a State court of conciliation and arbitration, it would still remain open to the men to attempt victory by a powerful strike that should extend from the men of Homestead to the railway men, who would decline to handle the output of Mr. Frick's mills, and to the unions of various classes of workingmen, who would refuse in anywise to deal with contractors and builders purchasing supplies of iron and steel from the tabooed works. Under such circumstances public opinion would be so strongly inclined toward a support of the strikers that their success would be almost inevitable.

Thus, if the State should provide an arrangement by which, in the last resort, either one of the two parties in an industrial dispute could demand the intervention of an official board of arbitration so constituted as to command and deserve respect, the decisions of such a tribunal, without being made formally compulsory upon either party, would, by virtue of the force of an orderly public opinion, become practically so. It might, therefore, be entirely sufficient for present purposes that our States should establish tribunals of conciliation and arbitration, whose intervention either party to an industrial dispute could demand, regardless of the disposition of the other party, the decision of the arbitrators to be binding only through the moral compulsion of a public opinion which demands the peaceful and orderly settlement of disputes.

Existing American Arbitration Acts.

The "Wallace Act" of Pennsylvania is a valuable recognition of the principles of arbitration, and was the first American law of its kind. But the court can only be called into existence upon the application of both parties to a dispute. The "Wallace Act" authorizes the creation of a voluntary trade tribunal for any judicial district of the state, in the iron, steel, glass, textile fabrics and coal trades. It provides a method for the appointment of an equal number of representatives of the employers and the organized employees who must, before proceeding to deal with any case in dispute, agree unanimously upon an umpire. In case of the failure of the members of the tribunal to reach a decision, the umpire is to be called in and his verdict is to be conclusive. The law does not, however, make compulsory the conclusions of the tribunal. In several serious situations, particularly in the coal trade, the "Wallace Act" has rendered valuable service.

In 1885 Mr. D. J. Ryan carried through the Legislature of Ohio, without a dissenting vote, a Bill providing for tribunals of voluntary arbitration. The Ohio law provides a method by which county tribunals may be established in any given industry or business, the tribunal to be composed of an equal number of employers and workmen. As under the "Wallace Act" of Pennsylvania, each of these Ohio tribunals is to have an umpire, chosen immediately upon the organization of the tribunal.

More recently Massachusetts, New York and several other states have recognized in one form or another the principle of arbitration by providing an official method for the formation of voluntary tribunals. Thus some real progress has been made in this country in the direction of the true solution of industrial disputes, and it only remains to give to official arbitration a more permanent and authoritative position. It would seem reasonable that the Governor of a state, who has power at his discretion to set the whole military force of the commonwealth into motion at great expense for the sake of preserving the peace at some scene of industrial conflict, might with equal propriety be authorized to institute an arbitration court with instructions to make prompt inquiry and render a decision which both parties would be invited to accept.

European Arrangements.

New legislation in Germany has given very considerable extension to previous arrangements for conciliation and arbitration, and would seem to put the local courts in a position which practically requires their intervention, while disputants would moreover seem to be brought under a considerable measure of compulsion, both as to the initiation of arbitration and as to the acceptance of the results. In England there has been legislation from time to time in recognition and encouragement of voluntary arbitration, but the most important results have been accomplished by standing tribunals privately established by agreement between employers and their organized employees in given lines of industry at important trade centres. The most recent development of conciliation and arbitration in England has been the scheme drawn up under the auspices of the London Chamber of Commerce, and now in a sort of semi-official operation, with a view to the abrogation of strikes and serious industrial difficulties throughout the metropolitan district.

The best experience of all industrial countries points to a combined arrangement, for conciliation in the first instance and arbitration as a final resort, as the best available means for the removal of disputes which otherwise endanger the peace and order as well as the general prosperity of great communities.

Mr. Thomas B. Clegg (Barrister-at-Law), Clerk of Awards, under the provisions of "The Trade Disputes Conciliation and Arbitration Act, 1892," (N. S. W.), in a carefully compiled manual of that Act and a succinct epitome of matters bearing upon its inception, published in October, 1892, "in a chapter on Industrial Conciliation and Arbitration in the Colonies," takes occasion to point out that

"The Great Strike of 1890, at a cost to the colony of at least £1,000,000, there being a loss of over £150,000 in wages alone, forcibly directed attention in this colony to

the advisableness of establishing some machinery which would enable the principles of conciliation and arbitration to be applied cheaply and effectively for the settlement of points of disagreement between the two sections of the industrial community.

"During the strike the Hon. Andrew Garran, M.L.C., placed on the notice paper of the Legislative Council a notice of motion in favor of a Royal Commission to take evidence and report on the labor question. The motion, after several postponements, was withdrawn on the ground that a parliamentary discussion on the subject might be inconvenient while the strike was still going on. The Government, then under the leadership of Sir Henry Parkes, without waiting for any parliamentary suggestion, decided to appoint a Commission. This was done on November 25th, 1890, and the Commission was instructed to consider and report upon the whole subject. Dr. Garran was appointed President, and no fewer than 55 witnesses, drawn from all sections of the community, but principally from the industrial ranks, were examined. A Bill based on the recommendations in the report on the evidence taken, and the literature collated on the subject was drafted.

"This Bill, introduced by Sir Henry Parkes on the 5th August, 1891, proceeded upon somewhat similar lines to the present Act. The resignation of the Parkes Ministry, however, prevented its Conciliation and Arbitration Bill being carried beyond the initiatory stages. Subsequently the present measure was introduced by the Ministry, under the leadership of the Hon. G. R. Dibbs (now Sir George R. Dibbs). The Attorney-General (the Hon. Edmund Barton, Q.C.), in introducing the measure, subsequently carried into law, stated that whilst it was far from identical from the first-named measure it still embodied a good deal of what was contained in Sir Henry Parkes' Bill.

"The second reading of the Bill was moved by the Attorney-General on the 10th March, 1892, the measure being carried through the Legislative Assembly with a degree of unanimity that fully expressed public opinion as to the urgent need for legislation in this direction. In the Legislative Council the second reading was moved on the 22nd March, 1892, by the Minister of Justice (the Hon. R. E. O'Connor), the Bill receiving His Excellency's assent on the 31st day of the same month."

The general schene of the Act is outlined by Mr. Clegg as follows:

1. The Colony is treated as one Industrial District or is divided into several Industrial Districts, as may be determined by the Governor-in-Council.

2. Each Industrial District has two "Recommending Authorities."

3. Each "Recommending Authority" includes the registered organization or a majority of the registered organizations representing the interests of employers and employees respectively.

4. Each registered "organization" is entitled to recommend members to the Council of Conciliation and the Council of Arbitration.

5. Where the Colony is one Industrial District there is one Council of Conciliation; where it is divided into separate Industrial Districts a Council of Conciliation is appointed for each district.

6. There is one Council of Arbitration for the whole Colony. There are two Recommending Authorities in each Industrial District, namely:

(*a*) The organization or a majority of the organizations representing the interests of employers, and

(*b*) The organization or a majority of the organizations representing the interests of employees.

The word "organization" may be taken generally as equivalent to employers' union or employees' union, as the case may be. In both cases, *i. e.*, of employers and employees, the organizations must be registered according to the law regulating the registration of trade unions or friendly societies, and having a registered office or offices within the district. They are arranged at present in eight classes, so far as employees are concerned, and so far as practicable, a similar division as to classes is applied in the case of employers. To each organization grouped in any one of the eight classes referred to, voting papers are issued by a duly authorized officer, one voting paper being for the purpose of recommending a member or members of the Council of Conciliation to represent

the employers or employees, as the case may be, in and for the class of trades or callings specified therein, and the other for the purpose of recommending a member of the Council of Arbitration to represent generally the employers or employees, as the case may be, and not in respect of any particular class of trades or callings.

The representatives or nominees having been determined upon by the members of the organization, the names of the nominees are inserted in the voting papers, which are then signed and countersigned in the manner prescribed, and forwarded by post to the registrar of friendly societies within the time limited.

It is the duty of the registrar upon the receipt of the voting papers, and the last day for their despatch being past, to count the recommendations recorded in each case and by each of the recommending authorities, and to forward them in separate batches, together with his report thereon. The minister upon being satisfied of the accuracy of such report publishes in the *Gazette* the result of the recommendations, and declares at the same time the names of the persons appointed by the Governor-in-Council upon the footing of the recommendations.

The members thus appointed hold office for two years, and are eligible for re-appointment.

The expenses incidental to the administration of this Act, exclusive of the expenses of the parties and witnesses, are to be defrayed by annual parliamentary appropriation. Witnesses' expenses, if any, are to be defrayed by the party calling them, and a witness may refuse to attend if reasonable travelling expenses have not been tendered to him by the party at whose instance the summons was issued.

The Act continues in force for four years, dating from the 31st March, 1892. Subsequent to the date just mentioned the first Councils of Arbitration and Conciliation were called into existence—the "Council of Arbitration" being composed of Andrew Garran, M.A., LL.D, President; and Messrs. Alex. Kethel (employers), and Peter J. Brennan, Ex-President of the Trades and Labor Council (employees), arbitrators; while the "Council of Conciliation" was composed of sixteen members—eight representing employers and the other eight representing employees.

The first meeting of these councils was held on the 13th of October, 1892, in the city of Sydney, N. S. W. At that meeting the president, Dr. Garran, delivered the following address:

"GENTLEMEN,—Now that the *personnel* to work the machinery of the Trades Disputes Act is complete, it has been thought desirable that we should meet—first, to make each other's acquaintance in a friendly way; and secondly, to consider and discuss the character of the work that lies before us, and the method of its accomplishment.

The main principle on which the policy of the Act rests is the substitution of pacific negotiations for war in trade disputes. Is that possible? The parliamentary assumption is that it is possible, and we are to work together to see if we cannot prove that assumption to be correct. Already two discordant criticisms have been heard. There are the optimists and the pessimists. There are those who expect from the new law more than it can possibly perform; and there are those who risk their reputation, as prophets, by predicting that it will prove an eggregious failure, and who assert that trade quarrels, like national quarrels must be fought out, and that blood and iron are the only healing surgery.

It is quite certain that we cannot alter the qualities of human nature. We cannot prevent men from being selfish and greedy, we cannot hinder conflicting interests from springing up, or cure quarrelsome dispositions. Contentions will arise where the opportunities and temptations are so many and so great. But what we can do is to deal with these quarrels in their inception, and take them early, before the breach between the parties has been hopelessly widened, and to effect a settlement, which would allow work to be continued or resumed without a great waste of resources or the generation of intense hatred. It is no part of our mission to reconstruct society. Whatever has to be done in that line belongs to the Legislature to do, and that body will only move after public opinion has been matured. Whether there ought to be one set of persons who are employers, and another who are employees, is a matter which, as conciliators and arbitrators under this Act, we are not called upon to discuss. We are set to take the world as it is, and you are distinctly appointed as representatives of the two industrial classes.

Given employers and employees, our function is to adjust their conflicting claims. Granting that conflicts will be always arising, springing as it were almost out of the ground, we have to deal with them while they are young and flexible. Everyone who is acquainted with the history of a strike knows that the dispute is much more manageable in its early stages than it is after the temper of the parties has become envenomed.

"Fluctuations of profit arise from causes beyond the control of either employers or employed, and the constantly acting force of self-interest presses with every change for a redistribution of the industrial result. Apart from this, industry in our days is so much complicated with invention, and the competition in the world makes it so necessary to be prompt in the adoption of new methods and processes, if the producer does not wish to be left behind in the race, that changes in the detail of work are continually occurring, and with such changes must come corresponding changes in the method of payment for work. The substitution of wood-cutting machinery for hand-work, of boot making machines for hand-work, of the sewing machine for the needle, are illustrations. Perhaps the next great change of importance will be the introduction of coal-cutting machinery into our mines. We know by experience how easy it is for quarrels to arise over the re-adaption of the pay-sheet to a new style of work. There is all the material for a strike, but yet it is perfectly possible to glide into the new arrangement without any unfairness to either side. Employers must contend for their profit, or they would cease to be, and the workman must contend for his decent subsistence, or life would not be worth having. A strike settles the question by superior force, and after a great waste of previous savings. The method of conciliation and arbitration settles it by an appeal to reason and justice. The question is always settled one way or the other. All wars end. There has never been such a thing in the history of the world as an interminable war. There is either abject submission or a treaty of peace.

"In our trade disputes, the absolute submission of either side is not desirable. Shall we crush the employer or crush the workman? Neither of the two is in the interest of our industrial prosperity or our social peace. We need not go outside the history of New South Wales to recall instances where strikes have led to the final winding up of large businesses. Who gained by such an ending of the strike? Certainly not the workman, who in many cases was on the lookout for months before he could again settle down into steady employment. Nor would it be difficult to point to cases where employers have held on, and in spite of all difficulties have filled the vacant places with new men. But what a dear bought victory it has been. Everyone who knows what it is to preside over an organized body of men, knows that to change the whole body at once means a great waste of time, labor and temper, and that means a loss of wealth. When the right men are got together they become more valuable as they get used to their work, used to each other, and used to their overseers. An employer when he is bearded will fight to the last rather than give in, and will part with every old hand to avoid submitting to what he thinks is unreasonable and humiliating dictation. But in his secret heart he knows the price he has had to pay for his pride.

"Yet if there is to be no crushing and no humiliation on either side, the terms of peace must be arranged amicably and equitably. Strikes are never amicable, and their termination is often not equitable, because force and not equity is the prevailing genius. It is the aim and intent of this new national institution, the working of which we are selected to inaugurate, to see if trades disputes cannot be settled both amicably and equitably. As I have already said, there are some who are confident that we shall not succeed. If we fail we shall fail in a good cause. But need we fail? In every quarrel there is a right and a wrong. If we can disentangle and straighten them out, and get rid of all the attendant misunderstanding and suspicion, it is not an impossible task to adjudicate on the merits of the central question. Nor need we be discouraged by the thought that absolute justice may not ever be attained, and is perhaps never attainable. It is not given to anything human to be absolutely perfect, but it is given to human effort to make a practical approximation to the perfect Perhaps no decision to be given by the Council of Arbitration will ever give entire satisfaction to both parties, and may perhaps never command the universal acquiescence of the critical public. And yet it may be sufficiently good for practical purposes, and the amount of defect in it may be small com-

pared to the amount of justice. What we have to do is to find what the diplomatists call the *modus vivendi*—some footing on which the contestants can live together more or less peaceably and contentedly—some basis on which there can be enough harmonious co-operation to admit of the business of life being carried on. This much may be certainly stated—that making the largest allowance for defective awards the very worst award ever likely to be given will be better for either party than a continuing strike. Moreover, there is this to be borne in mind that to accept and submit to an award that is not thought to be quite fair is a very different thing to submitting to defeat after an angry struggle. Human nature being what it is, submission to defeat is always sullen and leaves its mark on the temper, and sometimes for life. But even a passionate man may acquiesce in an award given by arbitrators who have at least tried to be fair, without any wound to his pride. And this matter of temper, both in employers and employed, is no inconsiderable industrial force. Every general understands the virtue of what is called the *morale* of an army. Troops that are depressed, despondent, that dislike and distrust their commanders, are prepared for defeat, but an army in high spirits and full of confidence and good will towards its leaders has half won the victory before the battle. It is precisely the same with the industrial corps. It is difficult to over-estimate the value to an employer of good-will in his work people. The difference between men who go to their work with elasticity and pleasure, and men who knock through the time in a spirit of sullen discontent, represents a large percentage of profit, and taken therefore on the lowest ground it is to the interest of an employer to have his men cheerful and contented. As to his interest morally, socially and politically, I need not speak. Yet he can never get this desirable good will as the result of a strike in which the men have been crushed. It is equally to the interest of the men to be on good terms with their employers, not only with respect to the happiness of each day's work, but as respects their efficiency, the profit they help to make, their claim on a share of that profit, and their prospects of advancement. Looked at all round, it is better for everyone to work in a spirit of peace than in a spirit of mutual hostility. Is it too much to hope that this fact, which is supported by so much experience, will carry weight with both parties?

"And now, passing from these general considerations, let us glance at the way in which we are appointed to work. Under the law we are divided into two bodies, a Council of Conciliation and a Council of Arbitration. This distinction is based on a pretty considerable experience. There are cases in which disputes arise in such a form that they are suitable for arbitration at once, and under the Act, if both parties are willing, they can go straight to the arbitrators. But there is no provision for setting the Council of Arbitration to work unless both parties are willing. Generally speaking, disputes turn upon details—very often upon a great variety of details, and these are obviously suitable for free discussion. The Council of Conciliation is established on purpose to deal with such matters. Whatever can be said for or against any proposal, either by masters or men, can be talked over by the interested parties sitting round a table, and a discussion of this kind can without much difficulty be made exhaustive. Experience shows that in most cases a practical solution of the difficulty will be found. But if conciliation fails, then the Act provides that the insoluble portion of the dispute can be taken by either party to the Council of Arbitration. This is only an imitation of a custom already in force among our northern collieries, where, under the agreement, a referee is appointed before whom either party may bring a dispute which they cannot settle. The referee's decision is binding, whether the second party chooses to appear in court or not. But hitherto the second party never has refused to appear.

"The reference to the Newcastle agreement leads me to the remark that the Council of Conciliation as formed under this Act does not in any way supersede the existing trade agreements or prevent their multiplication. It exists for the sake of those who want to make use of it, and is not in the way of those who do not need it. In some trades there may be a disposition to have their own agreements between employers and employed or to have conferences confined entirely to their own trade. There is nothing to prevent their doing so. There is this one point, however, to be noticed, that whatever is brought before the Courts of Conciliation can be forced on to a final settlement through the Councils of Arbitration. Private trade conferences do not necessarily lead to any

result. I need only refer by way of illustration to the conference that took place at the town hall prior to the maritime strike. The parties sat there for several days with a *bona fide* desire on both sides to come to a decision. Yet they separated without result. If they could have compromised their difficulties, or if they could have accepted the decision of a referee, possibly the whole strike might have been avoided. Certainly one element of difficulty would have been taken out of it. If, therefore, private conferences in the several trades are to be preferred to making use of the Council of Conciliation, it is to be hoped that the parties will from the start agree to refer any points which they cannot amicably settle among themselves to the Council of Arbitration. If this is done, then no conference need be barren. The end of the controversy will be in sight as soon as the conference begins. It is a matter for experience to determine which will be better—private trade conferences, or the use of the Council of Conciliation. On this point it is idle to predict, but it is important to insist on the fact that the Council, as established by law, will certainly lead to a definite conclusion, and that private trade conferences will not necessarily do so, unless there is a super-added to them an agreement to refer the insoluble parts of the dispute to the Council of Arbitration.

"It is quite possible, of course, that the Council of Arbitration will be seldom called into action. Nobody need cry over that. The more that disputes are settled between the parties without calling for an outside authoritative decision, the better it will be, because conciliation settlements are, from the nature of the case, acquiesced in by both parties, while an award always runs the risk of giving offence to one if not to both. Meanwhile the Arbitration Council will be effective even when it is dormant. The knowledge that it is there and will be brought into play will prevent either party from pushing extreme claims before the Council of Conciliation, knowing well that it would be useless to refer them to the higher court. A man who has insured his house all his life never complains that he has not been burnt out—he has enjoyed the security. The influence of the arbitrators will be felt even when it is not exerted.

"But, though every dispute which once gets into the Council of Conciliation will get to a settlement, it is not certain that every dispute will get there. When conciliation under the Act once begins it will finish, but what is to be done to make it begin? Time will show whether the Act will work of itself, or whether it will be expedient to put a little compulsion at the beginning of the process. Much is to be hoped for from a growing conviction that in industrial work peace is better than war. And yet that conviction may not operate widely enough or quickly enough, and it may be in the national interest that disputes should be forced to adjudication. Whether such interference with individual liberty should be ordained by law is a question of policy rather than of right. That the State may control the individual in the national interest is universally admitted. The police stop a brawl in the street without asking the leave of the parties. How much more is the State entitled to arrest a colossal dispute in which thousands of citizens are concerned, which threatens the peace of whole districts, and in consequence of which the Government is put to immense expense to protect life and property. The Legislature, which has now put its hand to the business of conciliation, will not stop short if experience should show that it is necessary to go further.

"As to compulsion in the inforcement of awards, that is quite a different affair. Where an award simply means a payment of money, that of course can be enforced. But how is a workman to be compelled to work on terms at which he kicks, when, according to his agreement, or the custom of his trade, he can give his fortnight's notice and retire from the service? And how is an employer to be compelled to carry on a business which will not yield him satisfactory results? Awards will be acquiesced in, as a rule, because it will be better to do so than to repudiate them. The cases in which they will fail of effect will be the exceptions. We may go to our work confident and content in that expectation."

Dr. Garran, with a zeal begotten of his evident faith in the advantages of conciliation and arbitration, followed up his work with vigor and perseverance, and addressed meetings of representatives of both employers and employees on the subject. In an address to representatives of employers at a meeting held on November 24, 1892, he spoke as follows:

GENTLEMEN,—The purpose in view in asking you to be good enough to assemble here this afternoon is to consider from the employer's point of view the advantages to be gained by keeping down strikes and lockouts, and the possibility of utilizing the State agency for settling trade disputes that has now been established under Act of Parliament. It is hardly necessary to waste any time in trying to prove that strikes, when forced on an employer, are to him an immense loss and inconvenience, and that a lockout, when he thinks himself bound to enforce it, is a remedy only less desirable than the disease. Nor is it necessary to point out the great extent to which labor troubles have existed during the last quarter of a century, or their formidable character since labor has become intelligently and effectively organized. The strongest proof of that danger is to be found in the fact that employers have of late found it necessary to form unions of their own, to stand by each other, and form a united front against what they consider the excessive demand of labor. When we remember that the employers in each separate trade are rivals to each other, and that as amongst themselves the principle of competition is in full play, it is easy to see how strong must be the sense of danger when employers feel themselves compelled to make common cause together. The competition between those who are striving for profits is very much more intense than the competition between those who are struggling for employment, and it is therefore quite in accordance with the laws of nature and the process of evolution that class union should have developed itself much earlier amongst the wage-getting than amongst the wage-giving class. But though union amongst employers has come later in time, has been much more difficult to bring about, and has always to resist a stronger disintegrate force, it has come as a direct consequence of the enormous attacking power which trades unions have given to labor. This is a fact which all employers will recognize.

That being so it behooves employers, not only to recognize present facts but to look forward and cast the horoscope of the future. What is going to happen if labor becomes more and more organized and if employers are compelled reluctantly to draw closer and closer together? Will the fact, that both parties stand confronting each other armed to the teeth, be a preventive of social war, and will such an attitude stimulate private enterprise or tend to check it? Profit being the avowed aim of business and the object to be sought by employing labor, will the profit be larger or smaller in proportion as the economic hostility is intensified? Or will there be more gains to the individual and therefore more gain to the community at large in proportion as the economic warfare is kept down to its lowest practicable limit?

In considering what answer should be given to this question, we must lay special emphasis on the fact that there has been almost uniform testimony to the effect that enterprise is held in check by the fear of labor troubles. Prudent people look about for investments that will keep them free from the entanglements of labor quarrels. They steer clear of manufacturing companies and of all industries that place their investments at the mercy of the labor organizations. They say without disguise that they prefer a small income with some reasonable degree of certainty, to a larger dividend that may at any time be suspended by a calamitous strike and that may possibly cripple the business for years. It is to this cause more than any other that we owe the very large amount of money lying on deposit at the banks. In the Australasian banks taken together that amount now exceeds £100,000,000—a very large amount indeed for a young community occupying territory whose resources are not half developed.

Is it possible to have a kind of insurance against labor troubles? There is no idea that has more thoroughly entered into the minds of commercial men of the day than that of insurance against risks, and the practice has given a calculable certainty to commercial operations that without insurance would not have been possible. Hitherto dangers arising from labor troubles have been looked upon as those against which no insurance is possible. The risk springing out of the Employers' Liability Bill, and which was at first considered as a menace to employers, has been mitigated if not neutralized by the establishment of accident insurance, but it seems hardly within the range of probability that private companies will guarantee against losses and strikes, for the simple reason that the loss is not a calculable one. If we cannot look for relief in that direction then we must look for it in another, and at present the only direction in which we can look for it is in that

of conciliation and arbitration, and there is no way in which these two agencies can be made so effective as by having the arbitration a State department. This is a thought which ought to sink deep into the minds of all employers who have had experience of labor trouble and who never know when similar troubles may overtake them again. They carry on their business under the uneasy feeling that they are exposed to an indefinable risk, one in which they may possibly be involved from no fault of their own, possibly from that of some other employer, but in whose quarrel their whole class is entangled. Can nothing be done to insure against this risk? Can anything better be done than to cultivate the policy of conciliation and arbitration?

There is a natural dislike which all employers feel to anything like outside interference with their affairs. It is by the free play of the spirit of individualism that our industries have grown to such magnitude and have so increased in their number, and it would be touching the springs of industry to discourage in any way the free play of individual effort. But this same individualism which is the source of our progress is also often the cause of our disputes and difficulties. Arbitration comes into operation when such individual action has created a difficulty and a danger which forebodes disaster, and is therefore invoked only to check such free action when it is admittedly becoming injurious. It cannot therefore operate to diminish the intensity of industry—it can only operate to protect industry against one of its most threatening dangers. It is pre-eminently a protective policy and it only acts restrictively when there is danger ahead. Under these circumstances anything like resentment against outside interference is more a display of temper than of prudence. The good element in self-assertion would be left unchecked. It is only the wilful and reckless enforcement of arbitary will that would be moderated.

Now, if this view is correct, and if it would be to the interest of all the employers in New South Wales to subject themselves voluntarily to some sort of control whenever they are threatened with a strike, is it not clearly to their interest to avail themselves of the services of the "Trade Disputes Act"? The law comes to them not as a limitation of their freedom of action but as a limitation of their dangers. It is in no sense whatever hostile to their interests, nor does it reflect on them as a class, but it offers them an opportunity of keeping down bad feeling between them and their employees, and of enabling them to carry on their business with a confidence that strikes may be prevented. If this can be done surely the conduct of business will be much more agreeable, the calculations of business will be so far safer, and the hostile attitude between the two great industrial classes will be greatly modified.

What then is the practical issue of these considerations? It is that employers should arrange forthwith to make it their policy to utilize the services of the Council of Arbitration. In nearly all disputes conciliation is the course precedent, and a frank and friendly discussion between employers and employed will often remove misconceptions and lay the basis for a satisfactory compromise. Under the Act as it stands employers can, if they like, take advantage of the Council of Conciliation as it is now organized. Or they can, under section V., have conciliators other than those which have been elected by the several unions. Or they can, if they like, have the conciliation quite outside the Act altogether. In the last case, however, there is no guarantee that the conciliatory discussion will lead to any practical result, and this can only be done by employers voluntarily making it part of their policy to include in their practice and to embody in their rules a reference of all insoluble disputes to the Council of Arbitration. If this is done, if it is made the rule in all trades, if it becomes the custom of the country, a strike will be the exception. What a gain that will be to all employers, and what can they possibly lose by sheltering themselves under the Council of Arbitration? The most erroneous award that could ever be given against them would be a trifle compared to the cost of a strike. If any serious error should be committed at any time in the adjudication of the council it is always possible to re-open the case on good cause shown, and as the law stands at present there is no compulsion attaching to the award. Nothing but its justice can make it operative. Anything like a scandalously wrong decision could be shown to be so. The fear, therefore, that employers might be putting their necks into a noose by consenting to submit to arbitration is a fear born of a needless suspicion.

And now what is the practical issue of these observations? To what do they lead up? Obviously to this: That if conciliation and arbitration are really in the interests of the employers it is to their interest to make effective the provisions of the "Trade Disputes Act." And they can do this by making it one of the rules of their union that they will take to the Council of Conciliation or Arbitration any dispute with their employees are likely to lead to a strike or lockout. A standing rule of this kind, even if it did not solve all difficulties, would be a guarantee that little troubles would not grow into great ones without some preventive being applied to the growth of the mischief. It would be a check, too, against individual employers embroiling the whole trade, and it would be a manifesto on the part of employers that their attitude towards labor was not one of oppression or overreaching, and that they were willing at all times to settle differences of opinion or interests on a footing of justice. Objections have been made in the past by employers to improvised arbitrations on the grounds that they were unsatisfactory, and that good natured, well-meaning arbitrators simply split the difference. That objection is, to a large extent, obviated by the constitution of the Court of Arbitration.

The situation, therefore, is this: labor difficulties have been highly injurious to the prosecution of private enterprise. Parliament has now established a tribunal expressly to deal with these difficulties in a practical and equitable way. Is it not under these circumstances alike to the interest and duty of employers to lend a loyal hand towards making this new institution a success?

The only possible reason for fighting shy of the "Trade Disputes Act" is the fear that in some possible dispute employers might find their hands tied and be unable to assert their rights as they otherwise would. But this fear, as I have endeavored to show, is entirely groundless. What bondage can there be in conciliation, which is merely discussion under the circumstances best calculated to clear up difficulties? Every dispute must have some ground or basis, and what can be more to the advantage of the employer than to become thoroughly possessed of the causes of discontent. It is not possible for him to know too much of how his workpeople think and feel, and whatever promotes his education in this direction is a direct benefit to him. It is also a benefit to him that they should understand the dispute from his point of view. All this educative work conciliation does. As to any bondage in arbitration there is none where the award is not compulsory. If it is right, then submission is no evil; if it is wrong, and demonstrably so, then it can be rejected, and public opinion would sanction its rejection.

Later, on December 1st, he addressed a meeting of representatives of employees called together by the Council of Arbitration. On this occasion he said:

Gentlemen,—I have to thank you for your courtesy in being here to-night in response to the invitation of the Council of Arbitration. The object in view in securing your attendance was not that you might listen to an address or in any way be lectured. Our purpose is to excite thought and discussion and interchange of opinion, especially on this point—whether the time has not now arrived for the labor societies to take a definite step towards settling disputes by conciliation and arbitration. The Government has done something, the Parliament has done something, and to-day the question is a practical one whether the labor organizations should not also do something. The Government has prepared the ground by the appointment of a Royal Commission on which labor was fully and efficiently represented. The report of that Commission not only laid the basis for a Bill, but brought the passing of such a Bill within the range of practical politics. Parliament, with the full concurrence of the labor representatives, has passed that Bill which is now law, and the organization for working it complete. But one thing is still wanting, and that is that the parties to trades disputes should bring themselves in line with the law, and do their part to make it effective. At present it has not been thought expedient to force disputants before the Conciliation and Arbitration Councils. Is it not therefore expedient that both parties should put compulsion on themselves and so bind themselves to utilize the agency that Parliament has placed at their disposal instead of resorting at once to the arbitrament of a strike? As you are aware, this view of the case has already been put before the representatives of the employers' unions, and one object to-night is to press the same matter on your attention.

In some trades there are agreements, and in all unions there are rules What is needed now is that there should be embodied in all agreements a clause to the effect that all disputes that cannot be settled by amicable conference should be made referable to the Council of Arbitration. Such a clause in an agreement would be equally binding on both parties. Where there is no agreement each union has its own rules, and it is open to every union to bind itself not to go headlong into a strike, but to utilize the State agency for the settlement of disputes. We are not meeting here to-night to discuss the way in which an Act should be framed, and therefore I will not go into any statement as to what other possible arrangement might be made. We have a particular law to work, and the immediate practical consideration is, what can we do to make that law workable? Can the unions acting singly but still acting harmoniously, superadd to their existing practice a rule to bring their disputes before the State tribunal?

There are many disputes which are of a trifling character, and which with a little good temper can be settled by a friendly discussion between employers, overseers and workmen. These need never make any noise outside the shop Other disputes go down deeper and are more difficult to settle. Still in all cases conference is the first step towards settling a difficulty. It is for this purpose that the Act provides a council of conciliation, and there are two ways in which this council may be constituted. A board of conciliators has already been elected and will hold office for two years. Two from each side may be chosen to constitute a council for any particular dispute; if it is not possible to bring about an agreement, then either party can pass the dispute on the Council of Arbitration for final adjudication. If the disputants would prefer to work outside the Council of Conciliation, as directly established by the Act, and would rather choose special men for the work, then under section 5 they can choose their own conciliators. It may sometimes happen that a new dispute has turned up on a fresh topic, and that both parties would rather be represented by men who are closely connected with the question and fully apprised of all its details. The Act provides that conciliators so nominated must be persons approved by the Government. When so approved these conciliators may become a council of conciliation within the Act. It is important to notice this fact, because whenever there has been a council of conciliation within the Act, then on the failure of the council to do its work either party may send the case on to the higher court. You will understand therefore that there are two ways of forming a council of conciliation within the Act—one by making use of the conciliators already gazetted, and one by appointing fresh conciliators for each dispute. Of course there is a third way, and that is by having a conference outside the Act altogether. The Act does not provide for this, but of course it does not prevent it. Such conferences have been frequent in the past in different trades, and sometimes with good results and sometimes with no result at all, but as such conferences are not within the Act an unsettled dispute cannot be referred to the Court of Arbitration except by voluntary agreement. When a question is ripe for arbitration it is always possible to go straight to the arbitrators, but then both sides must agree to do so. Under the Act the arbitrators can only listen to an application from one of the parties when they have both been before a council of conciliators and have not succeeded in coming to an agreement. The great importance therefore of having the conciliation within the Act, is that in case of no satisfactory agreement being come to, the services of the Council of Arbitration can be made immediately available. Now, this being the way in which the Act is worked, the question for to-day is whether the labor societies would voluntarily bind themselves to make use of the Act in every dispute which they could not amicably settle without any such reference? Such a rule by itself would not necessarily prevent a dispute growing into a strike because the other side might refuse to come before the Board of Conciliation at all. But is labor willing to say that, for its part, it is always willing to try conciliation and arbitration in the way the law has provided before attempting a strike? or would you prefer to hold yourselves free to choose a strike whenever you think it might bring about a more favorable result? It is a serious question and one to be thoroughly considered. In the past strikes have been the main weapon that labor has used. Now that the State has established an agency for dealing with disputes, is labor willing to give that agency the preference, and only to fall back on a strike when that

agency has failed? Is labor willing to adopt a self-denying ordinance and formally put a restraint upon itself binding itself over to keep the peace until the appeal has been first made to the State tribunal? This can be done, as I said, by incorporating a new rule with the existing ones to the effect that where any dispute arose between the employees in a union and their employer or employers, and no settlement could be privately arrived at, then it should be referred to conciliation under this Act with a reference, if needed, to the Council of Arbitration, and in the latter case it might be added that the award of the arbitrators should be accepted

It must be quite obvious that if a rule framed in this spirit were adopted by every trade union, labor in this colony would be in a position to say, "We at least are prepared for a pacific settlement of all disputes that are of a kind to be dealt with by conciliation and arbitration, and if we are forced to sterner measures, the fault does not lie with us."

If a similar rule were adopted by employers' unions, then the chances of hostile collision between the two industrial classes would be still further reduced. I do not go so far as to say that they would be prevented because there are many employers who are not in unions, and there may be some very profound social questions too big to be compassed by arbitration, but we should establish an enormous improvement on the present system.

It will be observed that I have suggested that the proposed rule should contain the words, "the award of the arbitrators shall be accepted." And it will be an immense gain if the rule can go as far as this. At the same time it is proper to note that the rule would have a great deal of value even if these words were left out. The law as it stands does not make any awards binding; it leaves them simply to their moral effects, and the unions would come quite abreast of the Act even if they abstained from promising to accept the awards of the arbitrators. It is a question I want you to consider and discuss whether by putting this additional limitation on your liberty you are doing your cause more good or harm. No award of course will ever be permanently binding. The conditions of industry are too much in a state of flux for that to be possible. Many awards may contain as a part of them that the settlement shall be for a time named, and even if there should be no such fixture a reconsideration would always be admissible after a reasonable time. The object of arbitration is to make a fair settlement, and if either party after a fair trial should satisfy the arbitrators that the award was not working equitably, there would be a reconsideration. Parliament has not thought it wise to make awards compulsory, but that does not prevent either employers or employees from accepting awards subject to reconsideration on good cause shown. Now, the practical and immediate question—and I particularly wish you to see that the question is both practical and immediate—is whether the adoption of some such resolution as this is not in the interest of the labor organizations. Will it not do something to commend their unions to public approval? Will it not do something to disarm suspicion? Will it not do something to satisfy employers that they desire nothing but what can commend itself to impartial adjudicators as fair and reasonable? It is well known to those who are concerned with placing the money of investors that there is just now in all the colonies a great distrust of all industrial undertaking. It is seen that the unions can precipitate strikes very suddenly, and can secure for them very widely extended and prolonged support. The consequence is a haunting fear that money invested in local industries may be placed absolutely at the mercy of federated labor, and there are many who would rather take four per cent. interest from a bank than run such a risk. Quoting the wise man they say, "Better a dinner of herbs where peace is than a stalled ox with strife." Now, it is the interest of all wage-getters to dissipate this apprehension as far as they can, to bind themselves over to push only reasonable demands, to accept on every claim the decision of reasonable and impartial adjudicators, and to show that the future of enterprise in this colony has nothing to fear from volcanic outbreaks from the labor quarter. There is no class in the community that has more to gain than the workers by setting capital free in industrial circulation. It has been its own enemy in shutting up capital; can it not be its own friend by disimprisoning it? There is obviously so much to gain by a pacific settlement of disputes, that it is necessary to ask what stands in the way of such a settlement. What has labor to fear in binding itself to accept arbitration? What ground is there for

suspicion? What can it lose? In what way does it tie its hands from doing anything that will be really in its own interest? These are questions I put plainly and fearlessly, because I want you to ponder them most thoroughly. I do not ask you to commit yourselves to any hasty expression of opinion to-night; but whatever objections there may be let them be brought out into the full light of discussion; let us see what they are, and how much they are worth, and how they can be met. The whole question is one of immense importance to every one in this colony who lives by wages, and it is the interest as well as the duty of everyone so circumstanced to give his hardest thinking to the question and then his vote for what he thinks the right policy.

In these few observations I have had no object but to put the case before you as clearly as I can. I do not of course conceal my own opinions, but I don't wish in the slightest degree to impose them on you. What I want is for the labor class to study the situation as it now is, and determine whether as a body they should or should not throw their influence in favor of making the law operative and beneficial. If they decide after a thorough consideration that the whole scheme will not do, that it is one they cannot avail themselves of, and that they will not attempt to patronize it, well and good, it must be so. The Royal Commission and Parliament will have labored in vain, and one more well meant failure will be recorded in history. But if they think that the scheme will be beneficial, then it is for them to try and make it so; and if they honestly do their best in that direction they will certainly have public opinion on their side, and they will go a long way towards bringing about that which they desire.

It is for you to determine whether you will make it a part of your fixed policy to exhaust the resources of the "Trade Disputes Act" before resorting to a strike, and whether you will by rule so bind yourselves as to make it impossible to be rushed into a strike before availing yourselves of the opportunity of a settlement which the law offers.

Mr. Thos. B. Clegg, already referred to, in the introduction to his Manual of "The Trade Disputes Conciliation and Arbitration Act, 1892," delivers his views most succinctly on the question in saying that

"It is not possible here to do full justice to a question of such universal interest, but some of the more apparent of the many advantages offered by a practical scheme embodying the principles of conciliation and arbitration may be briefly indicated. First, with regard to conciliation. The primary object of any scheme of this nature is to bring the parties to the dispute into contact. They meet upon neutral ground without distinction of dignity or privilege. The hostile attitude of the parties to a suit in our Courts of Civil Law is, so far as may be possible, eliminated from the meeting of disputants in a council of conciliation. It has been said truly that it appeals to and develops 'the higher human qualities of each.' Such a council is conceived in the spirit of concession and not of hostility.

. . . . . .

"It also seeks to anticipate and avert the evil of strikes and lockouts without waiting till actual estrangement between master and man has embittered the feeling on either side. It secures the continuity of labor, preserving unbroken the relationship between employer and employed, upon which, under existing conditions, depends the existence of so many of our fellow-citizens.

"Again, it preserves the self-respect of men engaged in industrial occupations by keeping the settlement of disputes within their own hands, avoiding the interposition of the stranger from without. Also, it discourages litigation with its heavy bill of costs, necessarily making a court of law more difficult of access to the poorer members of the community. Conciliation costs relatively nothing; whilst on the other hand it aims directly at preventing the waste of valuable capital and wage in the maintenance of costly strikes which at best only attain after a long struggle, in which misery and destitution play a tragic part, the end that a few hours' frank discussion might have reached at once.

"Arbitration is the complement of conciliation. What conciliation may have left undone or failed to do arbitration undertakes. In its method it is more formal and judicial than conciliation, and is generally in its application limited to the larger matters of industrial dispute, such as those concerning the interests of a whole trade. There is,

of course, nothing to prevent appeal to arbitration, but as a general rule it is more suitably resorted to after conciliation has failed, or where the issue is of such a nature that the more effectual means of dealing with it is that of arbitration. 'There may,' says a writer on this subject, 'be arbitration without conciliation, but the converse is not true, at least there cannot be systematic conciliation without some form of arbitration.'

"It affords an expeditious and inexpensive means of reference to a disinterested third party when the two parties to the dispute fail to agree. Again—it is elastic. The award of such a body may be left to the parties to accept or reject as they think fit, or it may be made equal to a rule of the Supreme Court in its power to coerce the parties to obedience.

"The awards of a council of arbitration are determined wholly upon the merits disclosed in the dispute laid before it, and without regard to

'That codeless myriad of precedent
That wilderness of single instances,'

cumbering every step of the parties to an action-at law.

"Where, as in ordinary cases, the award is voluntary, it depends for its enforcement upon the moral influence exercised upon their members by the organizations of capital and labor. It appeals directly to the honor and forbearance of each party. Its force is moral as distinct from legal.

"The system of councils of conciliation is admirably adapted to the modern development of trades unionism. It has been pointed out by writers on the subject as a matter well worthy of note 'that their efficiency is greater in the ratio of the completeness of the organization on either side.' This is manifestly true. The moral coercion which a union, whether of employers or employed, exercises over its individual members is direct and all.powerful. It carries with it a force far more intense than any individual appeal. The more complete the organization on either side the more effectual will be the working of this system.

"Finally, it offers a means of bridging the gulf which at every industrial conflict divides the community into two formidable sections. It proposes to substitute calm deliberate discussion, amity and conciliation for the blind 'antagonism which exists between the separate concrete masses of capital and labor.'

"To Mr. Mundella, a Nottingham manufacturer* and a standard authority upon the subject, is due the credit of having initiated in England a systematic scheme of industrial conciliation. The proceedings of the first Board established by that gentleman are described as being 'very informal—not like a Court, but the masters and men sit round a table; the men interspersed with the masters. Each side has its secretary, the proceedings are without ceremony, and the matter is settled by what the men call a 'long jaw' discussion and explanation of views, in which the men convince the masters as often as the masters convince the men.'"

Government to Fix the Minimum Rates of Wages.

Following the trend of the conclusions of the Labor Commission of New South Wales—nay, going a long step farther—Mr. Henry Doherty, of the silk firm of Doherty & Wadsworth, of Paterson, N. J., U. S. A., in an address before the Board of Trade of that city on the 12th of April, 1892, expressed most advanced views respecting strikes, their causes and cure. Mr. Doherty's views are the more striking because of their being held and expressed by one who is himself a large employer of labor. His paper was as follows:

Gentlemen,—The subject to be discussed this evening is one of great magnitude, as it does not only concern the citizens of Paterson but the citizens of the whole United States of America.

It is not my purpose this evening to condemn the employee or the employer, for by changing either the results would be the same under the present system of supply and demand. The workman makes his purchases where he can get them the cheapest. The

* Now Rt. Hon. A. J. Mundella, President of the Board, in the Cabinet of Rt. Hon. Wm. E. Gladstone.

manufacturer, claiming the same right also, procures his help in the cheapest market. This system subjects the workmen not only to the scarcity of employment but also to the concentration of capital, which is sometimes used to compel him to take for his labor what the circumstances of the case do not warrant. Labor seeing this takes the only reasonable course to combat capital, which is united action. So far, I think, the two factions have been about even ; but let us for a few moments, consider the cost of some of their differences. It is said four hundred thousand miners struck work at one time in Great Britain to prevent a reduction in their wages. The result was that coal went up four shillings per ton and was the cause of several industries shutting down. Consider the loss in wages to the four hundred thousand miners, and consequently the uncalled-for tax on the public and the temporary stoppage of numerous other industries. And all to prevent a reduction which was not justifiable to offer. We might mention numerous other strikes, no less detrimental, that have taken place in this country, such as the railroad strikes and others which would be too numerous and tiresome to mention separately.

Even in our own city during the last few weeks, since the trade has commenced to show signs of improvement, there has been in some mills a constant agitation going on and in several others strikes. And who can blame the operatives ? They are only taking the same advantage that was taken of them some time ago by their employers during a depression in business, and when they mostly needed the succor of human kindness. But there is still a more dangerous time coming if its evil influence cannot be checked in time. That is the consolidation of the different firms engaged in the same industry. There probably is not an industry in this country of any magnitude but what has already approached to the final consummation of this end.

We have already the sugar trust, the oil trust, the cordage trust, the railroad trust, the coal trust, the brewers' trust and others, but these are sufficient to show how things are tending in this direction. Now, if combined labor has had all that it could do in the past to fight individual capitalists, what chance will it have of fighting a combination of capitalists which must be ten times stronger than any combination the workmen may ever expect to effect ?

Gentlemen, I claim that it is more dangerous to the community for capital to hold this power than it would be for labor. Capital can afford to be indifferent, while labor would be compelled to be just, for the welfare of themselves and loved ones is at stake. Under such combinations of capitalists labor might organize its strikes, but they would be of no avail except to hasten on the deplorable condition which always follows helplessness under the control of personal greed.

Now arises the question how to do away with strikes and the causes which produce nine-tenths of them. I should here suggest calling upon Government aid as it is very often called upon to suppress riots, which are frequently the result of beaten and enraged labor. If prevention is better than cure, then why not avoid the evils which riots are often the result of ? I would suggest making it lawful for the Government to protect labor when a majority engaged in any industry thought proper to come under its regulations—which should be to fix the minimum rate of wages to be paid to the operatives of said industry, and to settle all disputes by arbitration. Such settlements should be binding and become a law, unalterable by any other body than the party appointed for that purpose. Any infringement of the same, by either employer or employed, should be considered a criminal offence and punished as the law might direct. The Board of Arbitration ought to consist of three representatives of the employers and three representatives of the workmen and one appointed at large. The representatives appointed by the employers and workmen ought to be changed as the different bodies thought fit to do so, but the one appointed at large should be reappointed every year. Under this law strikes would be considered a criminal offence, as they would be a violation of the decision of the Board of Arbitration, and should be punishable as the law might direct. Also any employer, or combination of employers, discontinuing their works in order to get a more favorable decision of the board, without being able to prove it impossible to run without loss, should be considered as an intimidation and punished as the law might direct.

I will give some of the benefits that would be derived from such a law.

First: A better understanding of the protective policy of the Government, as it would be the only limit to the increase of wages. Workmen would be placed in a better position to know whether they were getting the full benefit of protection or not and in a position to demand the same.

Second: The evil effects of the large immigration to this country would be prevented, as the number would have no effect on wages, it being a criminal offence to pay them less than citizens for the same amount of labor performed, consequently old hands would naturally have the first call.

Third: In case of a panic caused by a lack of confidence, or over-production, it would not result in a reduction of wages as a present; consequently just as soon as confidence was restored the usual prosperity would exist. But under the present condition it takes years to regain the usual tenor of things owing to the purchasing power of the country being so reduced by the gradual reduction of wages, which takes years of agitation and strike to get back to their former condition. Consequently panics, if any, would be of short duration.

Fourth: A better feeling would prevail, as all labor disputes would have to be settled on a just and honorable basis, which would be a benefit to the whole community and would eventually abolish strikes.

THE LAW OF CRIMINAL CONSPIRACIES.

By R. S. Wright, of the Inner Temple, Barrister-at-Law, Fellow of Oriel College, Oxford, England, (now Justice Wright).

The history of the law of criminal conspiracies and combinations may be conveniently divided into three periods, of which the first ends with the sixteenth and the second with the eighteenth century.

1200-1600.—There appears to be no evidence that, during the first of these periods, any other crime of conspiracy or combination was known to the common law than that which was authoritatively and "finally" defined in A.D. 1305 by the Ordinance of Conspirators, 33 Edw I., as consisting in confederacy or alliance for the false and malicious promotion of indictments and pleas, or for embracery or maintenance of various kinds. During the reigns from that of Edward III. to the end of that of Elizabeth, various statutes were directed against combinations for treasonable purposes or for breaches of of the peace, against combinations by merchants to disturb the markets or prices, and against combinations by masons and carpenters, by victuallers to raise prices, and by laborers to raise wages or alter hours; but no mention has been found in any of the writers' reports or abridgments of the period before the 17th century of any kind of conspiracy, confederation or combination being criminal at common law, except the crime of conspiracy as defined by the ordinance of 1305. The process by which this specific offence has been expanded into the comprehensive title of conspiracy or combination in the modern criminal law is now to be traced.

1600-1800.—The modern law of conspiracy has grown out of the application to cases of conspiracy, properly so called and as defined by the 33 Edw. I., of the early doctrine that since the gist of crime was in the intent a criminal intent manifested by any act done in furtherance of it might be punishable, although the act did not amount in law to an actual attempt. In accordance with this view it was determined in 1354 and again in 1574 . . . that although the crime of conspiracy, properly so called, was not complete unless in a case of conspiracy for maintenance, some suit had been actually maintained, or in a case of conspiracy for false and malicious indictment the party against whom the conspiracy was directed had been actually indicted and acquitted, yet the agreement for such a conspiracy was indictable as a substantive offence, since there was a criminal intent manifested by an act done in furtherance of it, viz: by the agreement, and from this time, by any easy transition, the agreement or confederacy itself for

the commission of conspiracy came to be regarded as a complete act of conspiracy, although traces of the original distinction between a completed conspiracy and the mere agreement or confederacy to commit it long continue to be found. Moreover, since in the Poulterers' case nothing had been done which amounted to a complete crime under the statute, it followed that the criminality of the agreement must in some sense be a criminality by common law; and Lord Coke's observations on this point in his report of that case soon received an extended application, and grew into a rule that a combination to commit or procure the commission of any crime was criminal and might be prosecuted as a conspiracy, although the crime might have nothing to do with the crime of conspiracy properly so called. . . . The convenience of this mode of procedure in permitting the conviction of persons without proof of a complete crime had already been proved in indictments for treason in 1600, 1680 and 1683, and seems to have completely established the practice in the reign of George I. . . .

The procedure by indictment for conspiracy was during the 18th century applied to combinations for a great variety of purposes made criminal by these principles, (set forth in judgments in the courts from time to time). It is next to be seen how, in certain cases after the ordinary criminal law receded from a portion of the wide area over which it had thus claimed jurisdiction during the 17th century, the law of conspiracy continued to be applied to combinations for purposes which had ceased to be criminal by the ordinary law.

Throughout the 17th century the question most frequently agitated was whether as between the mere combination for criminal acts on the one hand, and the execution of the proposed acts on the other hand, the gist of the crime lay in such a combination or included the execution of the acts proposed. This was material for determining how far the proposed acts must be fully and correctly set out in the indictment, how far the combination must be proved to have been carried towards execution, and whether a court which would not have had jurisdiction to punish the acts themselves might punish the combination, and whether in cases in which the proposed acts were prohibited by statute, the offence must be laid to be *contra formam statuti*. In the course of the 17th century it became settled law that as between the combination to do the criminal acts and the acts themselves the gist was in the agreement or combination for all the above-mentioned purposes; and that, even where the proposed acts were statutory offences, the conspiracy to do them might be laid and punished as a substantive crime at common law; and it became the current phrase that the conspiracy was the "gist of the indictment." . . .

1800-1872.—The most prominent characteristic of the law of criminal combinations in the present century is its extended application to combinations of workmen. Acts had in former times been passed to prohibit combinations of workmen for altering wages or hours, and during the 18th century several Acts had prohibited combinations for controlling masters in particular trades. In 1799 the Act of 39 George III. chap. 81, by sec. 1, provided that all agreements by workmen of any kind for altering hours or lessening quantity of work, or for hindering masters from employing such persons as they should please, or for controlling or in any way affecting a master in the conduct or management of his business should be "and the same are hereby declared to be illegal, null and void" to all intents, and by subsequent sections it provided that workmen entering into such agreements, or subscribing or collecting money, or attending meetings for the purpose of such agreements, or bribing, persuading, or influencing other workmen not to enter into hirings, or to quit their hirings, or refusing to work with any other workmen, etc., should be subject to imprisonment. In the following year this Act was repealed and replaced by the 39 and 40 Geo. III., chap. 106, which contained provisions substantially similar to those of the Act of 1799, but which required in the case of some of the offences that the acts must be wilfully and maliciously done. In 1824, the Act of 5 Geo IV., chap. 95, repealed all the then existing Acts relating to combinations of workmen, and provided that workmen should not by reason of combination as to hours, wages or conditions of labor, or for inducing others to refuse work, or to depart from work, or for regulating "the mode of carrying on any manufacture, trade or business, or the management thereof," be liable to any criminal proceeding or punishment for conspiracy or otherwise under the statute or common law. By another section it extended a similar

immunity to combinations of masters. On the other hand it enacted a penalty of two months' imprisonment for violence, threats, intimidation and malicious mischief. It was repealed after a year's trial, and was replaced by the 6 Geo IV., chap. 129, A.D. 1825, which continued in force until 1871. This Act again repealed the older statutes but without mention of common law. It provided summary penalties for the use of violence, threats, intimidation, molestation or obstruction by any person for the purpose of forcing a master to alter his mode of business, or a workman to refuse to leave work, or of forcing any person to belong or subscribe, or to conform to the rules of any club or association. It did not expressly penalize any combination or conspiracy, and it exempted from all liability to punishment the mere meeting of masters or workmen for settling the conditions as to wages and hours on which the persons present at the meeting would consent to employ or serve. In 1859 an amending Act was passed (22 Vict., chap. 34) for declaring that agreements by workmen or others as to the wages or hours of work, whether of the persons present at the meeting or of other workmen, and peaceable and reasonable persuasions by workmen or others to abstain from work in order to secure such wages or hours, should not be deemed to be molestations or obstructions within the meaning of the Act of 1825 ; but with a proviso that this enactment should not authorize breach of contract by workmen or persuasion of workmen to break their contracts. This Act also was repealed in 1871.

These statutes were soon enforced, as their predecessors had been enforced, not merely by the summary proceedings which they prescribed, but also by the more stringent means of indictments for combinations to infringe their provisions. Moreover, in the discussions which took place upon them the question was raised, and became the subject of some doubt and difference of opinion, whether in any and in what cases combinations for purposes dealt with by the Acts, and for other analogous purposes, are criminal "at common law." The effect of the discussions and decisions is too doubtful to be stated here. . . .

For the rest, during this period the doctrine that combinations to defraud by means not criminal in themselves may be criminal has been settled and perhaps extended, and the mode of proceeding by way of conspiracy against persons who combine to commit indictable offences has for the first time been applied to a combination to commit the common law misdemeanor of spreading false news with intent to disturb the public markets. In other respects the tendency of judicial legislation has been in general rather to narrow than to extend the application of the law of criminal combination, but no intelligible definition of "conspiracy" has yet been established.

"THE LAW OF CRIMINAL CONSPIRACIES AND AGREEMENTS, AS FOUND IN THE AMERICAN CASES."

By Hampton L. Carson, of the Philadelphia Bar (1887):

"The result of all the cases which had been tried before the courts ignoring matters of detail or special circumstances appears to be as follows : Workmen may combine lawfully for their own protection and common benefit ; for the advancement of their own interests ; for the development of skill in their trade, or to prevent overcrowding therein ; or to encourage those belonging to their trade to enter their guild, for the purpose of raising their wages, or to secure a benefit which they can claim by law. The moment, however, that they proceed by threats, intimidation, violence, obstruction or molestation, in order to secure their ends, or where their object be to impoverish third persons, or to extort money from their employers, or to ruin their business, or to encourage strikes or breaches of contract among others, or to restrict the freedom of others for the purpose of compelling employers to conform to their views, or to attempt to enforce rules upon those not members of their association, they render themselves liable to indictment. 'The rights of workmen are conceded, but the exercise of free will and freedom of action within the limits of the law is also secured equally to the masters.'

"Civil remedies have been enforced also both at law and in equity for injuries resulting from conspiracies belonging to the class.*

"It is deemed to be unnecessary to dwell upon the special features of each statute, as it would involve much repetition of matter. . . . It will be observed, however, that in some, as in New York, a definition of the offence is attempted. In others, as in Alabama and Delaware, no definition is given, and recourse must be had to the common law. In some, as in Florida, the statute is a concise epitome of the common law; in others it is simply declaratory, as in Pennsylvania and Kentucky, and covers but a part of the field. In New York no conspiracies are punishable except those expressly enumerated. In New Jersey the contrary has been held. In some, as in Arkansas as to all conspiracies, and in Alabama and Wisconsin as to those to commit misdemeanors only, an act to carry the conspiracy into effect is required to complete the offence; in others, as in Georgia, the contrary is stated. In some, as in Indiana, reference is only made to conspiracies to commit felonies, while silence is maintained as to conspiracies to commit misdemeanors. In some the statute is concurrent with the common law, as in Pennsylvania and New Jersey; while in others, as in Indiana, Iowa and Ohio, it is held that all crimes must be of statutory origin. In Minnesota it is said that a conspiracy to tar and feather a man, though not declared to be criminal by statute, is indictable as a common law offence. Some statutes are the result of careful study and codification, as in Florida, Tennessee and Texas, while others are evidently due to some local disturbance, such as the railroad troubles in Michigan and the political condition once existing in North Carolina, South Carolina and Virginia. Statutes relating to labor unions and conspiracies among workmen, either in express terms or by implication, are to be found only in Connecticut, New York and Pennsylvania." †

Chapter 266, Maryland Session Laws, 1884, details as follows:

SECTION 1.—That article thirty of the Code of General Public Laws of this State, title "Crimes and Punishments," be and the same is hereby amended by adding thereto the following additional section, under the new sub-title of "conspiracy":

SECTION A.—An agreement or combination by two or more persons to do, or procure to be done, any act in contemplation or furtherance of a trade dispute between employers and workmen shall not be indictable as a conspiracy if such act committed by one person would not be punishable as an offence; nothing in this section shall affect the law relating to riot, unlawful assembly, breach of the peace, or any offence against any person or against property.

SECTION 1 (chap. 267).—That any five or more persons, citizens of the United States, or a majority of whom are citizens of the United States, who are engaged in the same occupation or employment, or in similiar occupation or employment, may organize and form as a corporation, to be know as a "Trade Union," with such additions to the said name as they may adopt and set forth in their certificate, to promote the well-being of their everyday life, and for mutual assistance in securing the most favorable conditions for the labor of its members, and as a beneficial society, under the provisions of article twenty-six of the Code of Public General Laws of this State, as the same was enacted by the Act of 1868, chap. 471, and its supplements, in the manner in which other corporations, provided for in said Act, are authorized to be formed; each of said trade unions so organized and found as a corporation shall possess all the powers and be subject to all

*Statutes relating to conspiracy exist in the States of Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Virginia and Wisconsin.

None exist in California, Colorado, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Nevada, New Hampshire, Ohio, Oregon, Rhode Island and West Virginia.

In Connecticut the statute of 1878, which had its origin in the widespread railroad labor trouble of 1877, provides that "every person who shall threaten, or use any means to intimidate any person, to compel such person, against his will, to do or abstain from doing any act which such person has a legal right to do," shall be punished as therein stated. Although not applicable in terms, it has been extended to a conspiracy to boycott a newspaper."

†Statutes relating to labor unions and conspiracies among workmen either in express terms or by implication are also to be found among the laws of Montana, Nevada, New Hampshire, Texas, Vermont and Wisconsin. In fact in every State where statutes as to conspiracies and misdemeanors have been enacted they have "reference by implication" to organized labor bodies.

the regulations in said Act, and in its supplements contained, affecting benificial societies or associations authorized to be incorporated under the provisions of said Act and its supplements.

Michigan Session Laws (1885). SECTION 1.—That any number of persons, not less than five, may associate themselves together and become a body corporate and politic for the improvement of their several social and material interests, the regulation of their wages, the laws and conditions of their employment, the protection of their joint and individual rights in the prosecution of their trades or industrial avocations, the collection and payment of funds for the benefit of sick, disabled or unemployed members, the securing of benefits to the families of deceased members, and for such other and further objects of material benefit and protection as are germain to the purposes of this Act. The persons so associating shall execute articles of association as hereinafter provided, sign and acknowledge the same before some officer duly authorized by the laws of this State to take acknowledgments of deeds, and upon the execution and acknowledgment of said articles of association aforesaid the said association shall become a body politic for the purposes set forth in said articles of agreement.

SECTION 4.—Every association incorporated under this Act shall have power to make all needful by laws for its government, and enforce the same by the usual penalties and forfeitures; may thereby establish a uniform system of dues, assessments, or benefits to be levied upon members, prescribe the duties of officers, require bonds of the same for the faithful discharge of their duties.

SECTION 7.—All societies, unions, or associations of tradesmen or laborers, actually existing and conducting their affairs under a constitution or articles of association may become a body corporate and politic for the general purposes of this Act upon filing a copy of their constitution or articles of the association, society or union, verified by the oath of one of the executive officers of such society, association or union, in the office of Secretary of State, and a like verified copy in the office of the county clerk of the county where such association, society or union is formed. All societies, unions and associations becoming corporations as above provided shall be subject to the provisions of this Act.

SECTION 8.—The constitution or articles of association of the society, union or association referred to in the preceding section of this Act, when filed as therein provided, shall stand in lieu of the articles of incorporation required to be executed under this Act, and such constitution or articles of association may provide for the election of the trustees and other officers required by this Act, naming the officers to act as the first incumbents: *Provided*, That nothing in this section contained shall be construed so as to legalize any provisions that may be contained in said constitution or articles of association repugnant to the general laws of this State or to the public justice.

New Jersey Session Laws (1883). SECTION 1.—That it shall not be unlawful for any two or more persons to unite, combine or bind themselves by oath, covenant, alliance or otherwise, to persuade, advise or encourage by peaceable means any person or persons to enter into any combination for or against leaving or entering into the employment of any person, persons or corporation.

SECTION 2.—That all Acts or parts of Acts inconsistent with the provisions of this Act be and the same are hereby repealed.

SECTION 3. That this Act shall take effect immediately.

New York Revised Statutes (1778 to 1881). SECTION 1.—The provisions of subsection six, of section eight of chapter one, title six part four, of the Revised Statutes, shall not be construed in any court of this State to restrict or prohibit the orderly and peaceable assembling or co-operation of persons employed in any profession, trade or handicraft, for the purpose of securing an advance in the rate of wages or compensation, or for the maintenance of such rate.

New York Session Laws (1887). SECTION 1.—Any person or persons, employer or employers of labor, or any person or persons of any corporation or corporations, on behalf of such corporation or corporations, who shall hereafter coerce or compel any person or persons, employee or employees, laborer or mechanic, to enter into an agreement, either written or verbal, from such person, persons, employee, laborer or mechanic, not to join or

become a member of any labor organization as a condition of such person or persons securing employment, or continuing in the employment of any such person or persons, employer or employers, corporation or corporations, shall be deemed guilty of a misdemeanor. The penalty for such misdemeanor shall be imprisonment in a penal institution for not more than six months, or by a fine of not more than two hundred dollars, or by both such fine and imprisonment.

PURDON'S DIGEST OF PENNSYLVANIA LAWS (1700-1883). CRIMES.

SECTION 213.—It shall be lawful for any laborer or laborers, workingman or workingmen, journeyman or journeymen, acting either as individuals or as the member of any club, society or association, to refuse to work or labor for any person or persons whenever in his, her or their opinion the wages paid are insufficient, or the treatment of such laborer or laborers, workingman or workingmen, journeyman or journeymen by his, her or their employer is brutal or offensive, or the continued labor by such laborer or laborers, workingman or workingmen, journeyman or journeymen, would be contrary to the rules, regulations or by-laws of any club, society or organization to which he, she or they might belong without subjecting any person or persons so refusing to work or labor to prosecution or indictment for conspiracy under the criminal laws of this commonwealth: *Provided*, That this Act shall not be held to apply to the member or members of any club, society or organization, the constitution, by-laws, rules and regulations of which are not in strict conformity to the constitution of the State of Pennsylvania and to the Constitution of the United States: *Provided*, That nothing herein contained shall prevent the prosecution and punishment, under existing laws, of any person or persons who shall in any way hinder persons who desire to labor for their employers from so doing, or other persons from being employed as laborers.

The State of New York laws contain a statute "providing for amicable adjustment of grievances and disputes between employers and employees, and for the creation of a State Board of Mediation and Arbitration." Since the creation of the board just referred to its usefulness and advantages have, time and time again, been amply illustrated in the good work done throughout that State.

It may be added that laws providing for voluntary methods of arbitration are in existence in the States of Maryland, Pennsylvania, Massachusetts and New Jersey.

By the common law, as it is interpreted in Canada, according to Clarke's C. L. (1872), p. 401, "A conspiracy is an agreement by two persons or more to do, or cause to be done, an act prohibited by penal law, or to prevent the doing of an act ordained under legal sanction by any means whatever, or to do or cause to be done, an act, whether lawful or not, by means prohibited by penal law."

RECENT LABOR RULINGS BY (U.S.) FEDERAL COURTS.

"Review of Reviews," June, 1893.

Mr. Aldace F. Walker, chairman of the Commissioners of the Western Traffic Association, reviews in the *Forum* the decisions concerning the rights and obligations of workingmen which have recently been rendered by Judges Ricks, Taft, Speer and Billings, sitting in various divisions of the United States Circuit Court.

JUDGE RICKS' DECISION.

Judge Ricks, in the cases which came up for hearing at Toledo, held that a mandatory injunction may be issued, requiring employees of railroads to fully perform their duties connected with interstate commerce so long as they remain in service. This

decision is based on the ground that employees who accept the service of a common carrier, knowing the exacting quality of its legal obligation, assume an implied undertaking to perform their duties in such a manner as to enable it to discharge those obligations faithfully. Judge Ricks is of the opinion that the least time which can be claimed for a term of service on a railroad is a day's run, and that an abandonment of service after an employee has responded to a call would be a breach of contract.

Judge Taft's Decision.

Judge Taft, in the suit brought by the Ann Arbor Railroad Company against P. M. Arthur, Chief of the Brotherhood of Locomotive Engineers, ruled that acts tending to induce a boycott which would interrupt the movement of interstate commerce may be corrected and prevented by an injunction. Mr. Arthur, it will be remembered, was restrained by an injunction from issuing an order known as Rule 12, requiring employees to refuse to handle any cars or freight in the course of interstate transportation. Judge Taft's argument in brief is that connecting carriers are required by the Interstate Commerce Act to handle through freight offered for transfer. He admits that man has the inalienable right to bestow his labor where he will, and withhold his labor as he will, but subject to the provision that when the withholding of his labor is for the purpose of inducing, procuring or compelling his employer to commit an unlawful act, such with holding is unlawful.

Judge Billings' Decision.

The decision of Judge Billings in the Circuit Court of Louisiana was rendered the suit in equity brought by the United States against the Workingman's Amalgamated Council of New Orleans and other labor organizations, which was instituted during the strike in that city in November, 1892. In his decision Judge Billings confirms the propriety of an injunction against a combination of laborers acting in restraint of trade or commerce. The defendants in this case claimed that the Anti-Trust law, which provides that "every contract or combination in the form of a trust or otherwise, in the restraint of trade or commerce among the several states or foreign nations, is hereby declared to be illegal," was intended to prohibit monopolies and combinations of capitalists and not of laborers. The Court construes the law otherwise, finding that the source of evil was not material; that the evil in its entirety was dealt with; and that all combinations in restraint of commerce are interdicted without reference to the character of the persons who enter into them.

Judge Speer's Decision.

Judge Speer, in the Circuit Court of Georgia, approved of a receiver's contract for labor, but makes it subject to conditions which eliminate the boycott. He specially considers Rule 12 of the Brotherhood of Locomotive Engineers, and holds that there cannot be a doubt that the rule is in direct and positive violation of the laws of the land.

From the Strikers' View.

Mr. Frank P. Sargent, Grand Master of the Brotherhood of Locomotive Firemen, in an article in the *North American Review*, discussing the Ann Arbor strike from the strikers' point of view, gives his opinion thereon in the following language:

"The strike on the Ann Arbor and North Michigan Railway had no extraordinary features, but the interference of the United States judges have given it national prominence, and if the dictum of these judges is to stand as the law the dearest rights of the citizen are swept away and an autocracy is established. This view of the situation is not strained, but is strictly in consonance with the avowals of the press throughout the country. The questions of law involved are fundamental, and are commanding, as they should command, the best thought of the nation. It has hitherto been conceded that

railroad employees possessed all the rights as citizens which attached to their employers —that is to say, that if employers possessed the right to discharge employees when it pleased them to exercise such authority, the employee also possessed the right unchallenged to quit work when he elected to exercise that right. If a judge of a United States court may abolish this right of an employee, he remands him, unequivocally, to a servitude as degrading as the Spartans imposed upon their helots; and it is this phase of the strike which has aroused such intense concern and alarm.

"The learned judge, in his decision, finds it convenient to omit all reference to the duties of railroad magnates, and devotes his attention to employees, intimating to them that, having sought employment upon railroads, they have become, by some legal hocus-pocus, a part of the machinery, to remain during the pleasure of their employer. In handing down such a judicial opinion, the judge seeks to bury out of sight the inalienable right of a railroad employee to liberty and the pursuit of happiness. If an engineer, he is welded to the throttle of his engine; if a fireman, he can lay down his pick and scoop only when his master gives him permission. The Interstate Commerce Law is invoked, it is true, and the whys and wherefores of the boycott are involved; but the judge, disdaining to be exact, gives employees to understand that once becoming engineers or firemen, they part with their rights as citizens and are links in a chain-gang of railroad employees, because they are in some sense public servants, and the exercise of the prerogative to quit work is productive of inconvenience. But it will be observed that no reference is made to public needs or inconvenience when an official, without notice or warning, at his own sweet pleasure discharges an employee.

"It has been suggested that a railroad employee, when he accepts service, enlists—something after the manner of a private soldier in the regular army of the United States —placing himself under the control of officers, from corporal to the commander of the company, regiment or division, and therefore can neither quit nor resign, but is held by some mysterious power recently discovered by a United States judge. True, it may be that neither railroad men nor the public profess to clearly understand what the judge means; but the best efforts that have been made to comprehend his declarations lead to the conclusion that they restrict the rights of employees and indefinitely enlarge the rights of employers"

Mr George Gunton, in the *Social Economist*, interprets the decisions of Judges Ricks and Taft to mean that it is illegal for laborers to refuse to handle the products of striking concerns, or to resign their positions if forbidden so to do by the court, or even to take the advice of their leaders or friends regarding such action unless the advice is against it; and this, he declares, means nothing more nor less than the entire suppression of labor unions as active economic organizations.

But to imagine that "such ruthless suppression of laborers' rights, which it has taken centuries to acquire, will be tolerated in this age and country," says Mr. Gunton, "is to mistake the whole spirit and temper of the American people. If the decisions of Judges Ricks and Taft are finally sustained by the higher courts, instead of suppressing the organized action of workmen as intended, they will but divert it in the direction of government ownership and control of industry. Nothing could more effectively stimulate political socialism than the prohibition of industrial organization. Like the aristocracy of Belgium, American capitalists will have to learn that freedom, once acquired, will never be surrendered. If its natural expression is prevented, it will find vent in an unnatural and more dangerous form

"Like trusts and other large capitalist organizations, it may be said with absolute certainty that trades unions are here to stay. There is no power in society that can suppress them without permanently disintegrating society itself. It is proverbial that the more perfect labor organizations become the more intelligent, conservative and responsible is their action and the less frequent the resort to strikes. The history of the Brotherhood of Locomotive Engineers involved in the Ann Arbor strike, is a demonstration of this.

"The remedy for strikes and boycotts is not, as we have said, in suppressing labor organizations but in recognizing their social and economic legitimacy by putting them on

the same legal basis with organized capital. In order to do this it is only necessary: (1) To give trades unions a legal status by incorporation. (2) To make it a misdemeanor for any capitalists or corporations to institute a lockout or discharge laborers solely for the purpose of breaking up labor organizations. (3) To hold labor organizations responsible for the fulfilment of contracts made with employers by their members. (4) To hold capitalists and corporations entirely responsible for their contracts independently of their laborers. (5) When a strike occurs, to allow strikers the same right to interview new employees taking their places, and to use moral or financial inducements to prevent them from so doing, as the capitalists or corporations have to induce them to accept the vacated positions.

"If these propositions were made law they would restrict no one's freedom, but would simply put organized labor on precisely the same footing as organized capital. They would both occupy equal competitive positions. Laborers would have all the rights that capitalists possess and *vice versa*. Corporations would have no more advantage over their laborers in an industrial dispute than they now have over competing roads in freight war. Such remedies, besides being economic would be distinctly democratic, putting both parties on the same plane instead of as now legalizing away the rights of one to the monopolistic advantage of the other.

Decision of the Lord Chief Justice of England.

The Lord Chief Justice of England (Coleridge) and Mr. Justice Hawkins, sitting in the Court of Queen's Bench on the 22nd of last April, decided in favor of the Operative Bricklayers' Society of Hull and several other building trades unions, whose officers were charged with conspiracy by a contractor named Temperton, who sued for an injunction against being boycotted. The Lord Chief Justice, in giving his opinion, said that "Parliament has again and again declared that labor men have the right of combination, and if it is sought to put down trades unions it is for those who wish to do so to appeal to the Legislature and not to the courts." The following are the facts as well as judgment in the the case referred to:

[IN THE COURT OF APPEAL FEB. 22-23, 1893.]

Temperton *vs* Russell and Others.

Practice—Parties—Persons having the same Interest in One Cause or Matter—Suing One of a Number of Persons on behalf of all Trade Unions—Action for Maliciously Procuring Breaches of Contracts—Order XVI., r. 9.

Order XVI, r. 9, provides that, where there are numerous persons having the same interest in one cause or matter, one or more of such persons may sue or be sued, or may be authorized by the court or a judge to defend in such cause or matter, on behalf or for the benefit of all persons so interested.

The writ of summons in an action stated that the plaintiff sued the defendents, who were respectively the officers of several trade unions, as well on their own behalf as on behalf of and representing all the members of each of the societies to which they respectively belonged. The action was for maliciously and wrongfully procuring and coercing persons who had entered into contracts with the plaintiff to break such contracts and to refuse to enter into other contracts with the plaintiff, and for conspiracy to injure the plaintiff. The plaintiff claimed damages and an injunction.

Held, affirming the decision of a Divisional Court, that the case was not a case within Order XVI., r. 9, and the writ must be amended by striking out the words indicating that the defendants were sued in a representative capacity.

Order XVI., r. 9, applies only to persons who have or claim some proprietary right which they are asserting or defending in the cause or matter.

Appeal from the order of a Divisional Court directing an amendment of a writ.

The action was by the writ expressed to be "between Joseph Temperton, plaintiff, and J. Russell, president, and H Stephenson, secretary of the Hull branch of the Operative Builders' Society; J. Belt, president, and W. Byrne, secretary of the Hull branch of the Builders' Laborers' Society; C. Clark, president, and John Trueman, secretary of the Hull branch of the Operative Plasterers' Society; E. Annis, president, C. Clark, vice-president, and J. Devine, secretary of the joint-committee of the Hull branches of the

Operative Bricklayers, Builders' Laborers and Operative Plasterers' Societies (as well on their own behalf as on behalf of and representing all the members of each of the said societies and joint committee to which they respectively belong), and J. Russell, H. Stephenson, J. Belt, W. Byrne, C. Clark, John Trueman, E. Annis and J. Devine, defendants." It appears from the indorsement on the writ and also from the statement of claim, that the claim of the plaintiff, who was a builder at Hull, against the defendants, was in substance for damages for maliciously and wrongfully procuring certain persons to break contracts into which they had entered with the plaintiff, and not to enter into other contracts with the plaintiff, for maliciously and wrongfully enticing and procuring certain workmen in the employ of the said persons to leave the service of their employers and to break their contracts of service with intent to injure the plaintiff and to prevent the said persons from carrying out their contracts with the plaintiff, or entering into other contracts with the plaintiff; for maliciously and wrongfully intimidating the said persons and coercing them to break their contracts with the plaintiff, and not to enter into other contracts with the plaintiff, and intimidating the servants in their employ and coercing them to leave the service of their employers to the injury of the plaintiff; and for unlawfully conspiring together and with certain other persons to do the acts aforesaid with intent to injure the plaintiff; and the plaintiff also claimed an injunction to prevent the continuance and repetition of the matters complained of.

An application was made, on behalf of the defendants Russell and Stephenson, to strike out of the writ the words in brackets. The Master refused the application, and the Judge at Chambers on appeal affirmed his decision; but the Divisional Court (Lord Coleridge, C. J., and Hawkins, J.) on appeal to them granted the application.

Channell, Q.C., and *Montague Lush*, for the plaintiff. This case comes within the terms of Order XVI., r. 9. The members of the trade unions, whom the plaintiff seeks to sue through the defendants as their representatives, are in substance claiming a right in their own interests to interfere with the plaintiff's business in the manner complained of; while on the other hand the plaintiff asserts that the course pursued by them is an illegal infringement of his rights. There is, therefore, a question of legal right between the plaintiff and a numerous body of persons who have the same interest in the cause or matter. The words are not "the same interest in a subject matter," but "the same interest in the cause or matter." That means the proceeding that is pending. Here the societies, of which the defendants are officers, have the same interest with them in the proceeding. The object of the rule was, that in such a case a plaintiff might not be obliged to sue and set out the names of a numerous body of persons, which might be very difficult or impossible; and practically, if such a case is not within the rule a person injured through the action of a trade union can have no redress against them, for the case is not within the ninth section of the Trade Union Act. 1871 (34 and 35 Vict. c. 31), which in some cases permits the trustees of a trade union's property to be sued. The individual officers or members of such a society, who have actually done the acts complained of, may not be worth suing, and unless the society and its funds can be got at there will be no remedy. Of course it would be necessary for the plaintiff at the trial to prove that the members of the trade unions, as whose representatives he sues the defendants, really authorized the acts of which he complains. The action is mainly for an injunction. The rule was intended to embody the old Chancery practice, and in the Court of Chancery the course in such cases was to sue one of a body of persons who had a similar interest: see *Springhead Spinning Co*, v. *Riley* (1), where the prayer of the bill was that the defendants, as well on their own behalf as on behalf of all other the members of their association, might be restrained from interfering with the plaintiff's business; see also *Pare* v. *Clegg* (2); *Bromley* v. *Williams* (3); *Commissioners of Sewers of the City of London* v. *Gellatly* (4); *Commissioners of Sewers of the City of London* v. *Glasse* (5).

E. Morten and *L. G. Pike*, for the defendants Russel and Stephenson, were not called upon.

The judgment of the Court (Lord Esher, M.R., Lindley, L.J., and Bowen, L.J.) was delivered by

Lindley, L.J. The question whether the defendants can be sued in the manner in which they have been sued depends on the terms of Order XVI., r. 9, which provides

that "where there are numerous persons having the same interest in one cause or matter, one or more of such persons may sue or be sued, or may be authorized by the court or a judge to defend in such cause or matter on behalf or for the benefit of all persons so interested." The question really turns on the meaning of the words "having the same interest in one cause or matter." This expression only extends, we think, to persons who have or claim some beneficial proprietary right which they are asserting or defending in the cause or matter. The plaintiff in this case sues for damages, and the action, assuming it to lie at all, as to which we pronounce no opinion, is founded on tort. The old Court of Chancery had no jurisdiction to grant relief in such an action, and, although its rules as to parties to actions or suits maintainable in it have now to be applied in all divisions in the High Court when exercising the old jurisdiction of the Court of Chancery, the rules ought not to be construed as creating a jurisdiction in one Division, which was never exercised by any court in the country before the rules were made. But then the plaintiff asks for an injunction. This is an equitable remedy. But a suit for an injunction in such a case as this, even if maintainable at all, certainly could not be so framed as to bind persons not actually parties to it. What right is it which the plaintiff asserts? It is a right not to be molested in the conduct of his business. Who are the persons against whom he seeks redress? They are a number of persons belonging to various trade unions acting more or less in concert, but the persons assumed to be represented by the officers of those trade unions have no such interest as is contemplated by the rule as above explained. The truth is that this is an attempt to stretch the rule in cases to which it is wholly inapplicable, and the attempt is only plausible by reason of the ambiguity of the expression "same interest." The case of *Springhead Spinning Co.* v. *Riley* (1), relied on by the plaintiff's counsel, is no authority for them. In the first place the case was overruled by the Court of Appeal in *Prudential Assurance Co.* v. *Knott* (2), and in the next place the suit was not in form a suit against the defendants as representing others, although the prayer was for an injunction against them in that character. The point now raised could not arise, and did not arise in that case on demurrer, for it was no objection to a bill in equity that, besides a relief which might lawfully be claimed, it claimed also a relief which was impossible.

The words struck out by the Divisional Court ought never to have been inserted, and the appeal ought to be dismissed. *Appeal dismissed. Law Reports: 1893.—Vol. I., Q. B.; Part IV., April 1.*

THE NEW LABOR DEPARTMENT OF GREAT BRITAIN.

Early in 1893 a joint deputation from the Parliamentary Committees of the Co operative Union of Great Britain and of the Trades Union Congress, was accorded an interview by the Right Hon. A. J. Mundella, a Cabinet Minister and President of the Board of Trade. This deputation was for the purpose of impressing upon the honorable gentleman, as a colleague of Right Hon. Wm. E. Gladstone, the desirability of making the labor department of the Board of Trade a comprehensive and perfect piece of machinery. Mr. Mundella was accompanied by Mr. Burt, M.P., Parliamentary Secretary to the Board of Trade; Sir Courtney Boyle, K.C.B. (in the absence of Sir Henry Calcraft, K.C.B.); Mr. R. Giffen, C.B, of the Commercial Department; Mr. John Burnett, Labor Correspondent, and Mr. F. J. S. Hopwood, private secretary.

Mr. John Wilson, M.P. for Mid-Durham, introduced the representatives of the Co-operative Union, and Mr. Benjamin Jones, Mr. J. C. Gray, and Mr. F. Hardern (Oldham) spoke on their behalf.

Mr. C. Fenwick, M.P. introduced the representatives of the Trades Union Congress. He looked with some degree of pleasure to the prospect of a development of the labor department which Mr. Mundella so wisely created in 1886, and he was glad to think that, instead of a centralization, there was to some extent to be a decentralization of power in the way of collecting and marshalling the labor statistics.

Mr. Mundella, in reply, said: It is with very great pleasure to me, and a very great encouragement to those who sit around me, to receive these two deputations, and it is a great satisfaction to me that you are at one with us in the ideas which we have on

the construction of this new organization. You have asked me for an extension of what you call the labor bureau, but what I should prefer to call the labor department. Before we part with the old department, which has been only an appendage of the Commercial Department, let me say a few words in justice to the men who have had the conduct of the business of the labor work during the last seven years. When Mr. Bradlaugh brought his idea before the House of Commons, I had already arranged with him that, if we could get the House of Commons on our side, we would make a start in that direction, which I hope to-night we are met here to complete. It was a bold thing to go to the Treasury and ask that I should appoint one of the secretaries of the leading trades unions of England as a member of the Government department. Well, no better appointment ever was made, or ever could have been made, than that of Mr. Burnett as the labor correspondent of the Board of Trade. I am speaking not only the opinion of officials, but also of political chiefs who have gone before me, and who have from time to time expressed to me the invaluable services which he has rendered with so much tact and judgment, not only in connection with labor statistics and labor reports, but also in respect to work of the Government and in respect of information which the Government itself required in relation to that work. Mr. Burnett has had a very insufficient staff—what has been described as a one-horse machine, but some most admirable work has been done. Having referred in detail to the work accomplished, Mr. Mundella went on to say: When Mr. Gladstone invited me to take my place again as President of the Board of Trade, I put before him the importance of making this labor department an independent department and a reality. Mr. Gladstone gave me as my colleague a man of whom we are all proud. You must know that Mr. Burt made it a condition almost with the Prime Minister that we should be able to undertake this work and carry it through. I cannot tell you how much I am indebted to him for his wise counsel, his great energy and experience, and his eminent good sense and reasonableness, which he always brings to bear upon every subject with which he deals. There has been much speculation in newspapers as to what our new department is to be. It is very difficult to keep anything back from the newspapers, but we have not tried to keep our secret too strenuously, because my friend, Mr. Burt, told the whole story when he addressed his constituents, and we have been at it ever since we entered this department. England is the greatest industrial nation of the world. She has the most important body of laws dealing with industry and with the regulation of various industries. What we hope to do is to create a department which shall make this a board of trade in reality—a board of trade without labor is a very odd board of trade after all. We are determined that the Labor Department shall have all the advantages which can be derived from our existing departments, but that it shall not be a mere appendage of any department, but shall be an independent department having a local habitation and a name. Now I hold in my hand what has been up to this moment a confidential memorandum. This memorandum is one that I have submitted to my colleagues in the Government, and which has been accepted, and which we are about, as rapidly as possible, to bring into operation. The right hon. gentleman then read the memorandum, which is as follows:

The New Branch of the Board of Trade.

The work of collecting, digesting and publishing statistical and other information bearing on questions relating to the conditions of labor will in future be intrusted to a separate branch of the Board of Trade. This branch will take over the work of the present Commercial Department at the Board of Trade, and will consist of three distinct departments—commercial, labor and statistical—the whole being under the superintendence of Mr. Giffen as Controller-General.

The Special Staff.

The special staff in the central office of the labor department, which will occupy separate buildings of its own (temporarily in No. 43 Parliament street), will consist of a commissioner for labor (in the general direction of the department), a chief labor correspondent, three additional labor correspondents (one of whom will be a lady), and about thirty clerks of all grades.

Local Correspondents.

Local correspondents will be appointed in a number of large provincial towns, so far as possible in the same centres as are contemplated for factory inspection. These local correspondents will be charged with the duty of informing the department of important events affecting labor which take place in their districts, and of supplementing, where necessary, the inquiries of the central office by local investigation. It is possible that in the future the local centres thus established will have additional duties cast upon them.

Branches of the Work.

The main branches of work contemplated at present, besides the continuation and extension of the work hitherto carried on by the labor correspondent and others in the commercial department of the Board of Trade in regard to wages, strikes, trades unions, immigration, hours of labor, etc., are the following :

A "Labor Gazette."

1. A *Labor Gazette* will be issued, at first monthly, but perhaps more frequently hereafter. Its object will be to supply accurate information on subjects of special interest to workmen and workwomen. Thus Mr. Burnett's monthly reports on the state of the skilled labor market will appear in a more well developed form in the *Gazette*. There will be also an account of trade disputes begun, closed or in progress during the month, and of important industrial negotiations such as arbitrations, changes of sliding scales, apportionment of work between different trades, etc.

Monthly Digest of Reports.

A monthly digest will be published of reports from factory and mines inspectors to the Home Office, on the state of labor in their districts so far as it comes within their province, on accidents, proceedings under the Factory and Workshops' Acts and Mines Regulation Acts, and it is hoped, so far as practicable, to refer to important proceedings under the Employers' Liability Act, to action taken by local authorities with regard to the sanitary condition of workshops, and by local authorities under the Acts bearing on the housing of the poor. Important meetings and conferences, *e.g.*, the Trades Union and Co-operative Congresses, the meeting of the Miners' Federation, international congresses on labor questions, etc., will be noticed. It is proposed to obtain from the Chief Registrar of Friendly Societies a monthly account of all trades unions, workmen's co-operative societies and friendly societies registered or dissolved during the month.

Different Branches of Labor.

It is hoped, by arrangement with the Board of Agriculture and otherwise, to obtain for the *Gazette*, from time to time, particulars as to the working of the Acts for providing allotments and small holdings, and other matters bearing on the condition of agricultural labor. At frequent intervals reports on matters specially affecting women's labor will be prepared for the *Gazette* by the lady labor correspondent. An effort will be made to supplement the report of the chief labor correspondent on the state of the skilled labor market by obtaining each month accurate particulars as to changes in the volume of employment in certain irregular trades, *e.g.* (possibly), London dock labor (in continuation of the inquiry completed for the Royal Commission on labor by Mr. Charles Booth) ; besides treating of these and similar special labor subjects, it is hoped to give statistics in the *Gazette* on such subjects as pauperism, savings banks, education (especially in its industrial aspects), exports and imports, and the retail price level of the chief articles of ordinary consumption by workmen, as well as comparative tables of the wholesale prices of leading articles in the chief markets of the world. Notices will be inserted of the more important events affecting labor in various foreign countries, and a list will be periodically published of Government publications, both in the United Kingdom and

abroad, which treat of labor matters, with a short popular abstract of the contents of the more important of these documents and of important legislation at home and abroad passed from time to time having an important bearing on labor.

The "Labor Gazette."

The *Labor Gazette* will be published at 1d., and a large number of copies will be gratuitously distributed to free libraries, workmen's organizations, mechanics' institutes, chambers of commerce, and other institutions.

Special Inquiries.

2. Special inquiries will be undertaken from time to time by the labor department into important subjects bearing on labor on which adequate information is not at present available. Among the subjects requiring such special inquiries, which the Department hopes to enter upon shortly, are:

(*a*) The amount and causes of fluctuations of employment in certain seasonal and irregular trades, and their effects on the conditions and efficiency of the labor employed.

(*b*) An account of actual attempts made in the United Kingdom or abroad to relieve distress by providing public work either by relief works, municipal or national workshops, farm colonies, or the like, and the causes of their failure or success.

(*c*) Certain questions bearing on the conditions of child employment both in and out of factories and workshops.

(*d*) An account of the effects on labor of noxious processes in use in certain typical groups of unhealthy trades, *e.g.*, potteries, white lead works, cutlery, chemicals, etc., treated so far as practicable both from the statistical and the scientific and medical points of view.

Other important matters which may also probably demand special inquiries are the economic effects of alien immigration, various methods of wages, payment and adjustment (*e.g.*, sliding scales, profit sharing, co operation, etc.), work of married women, cost of living, hours of labor, overtime, etc.

3. The Department also will be prepared to carry out such special inquiries as may be ordered from time to time by Parliament into labor questions.

An Annual Report.

4. The Department hopes to publish an annual report of its proceedings, framed as far as possible so as to be a handy book of reference for workmen to the principal labor questions which have engaged the attention of the Department during the year.

Mr. John Wilson, M.P., thanked the right hon. gentleman for the very full and complete statement which he had made to them.

Subsequent to the above interview, and as indicated by the Right Honorable the President of the Board of Trade, a Department of Labor was created under the superintendence of Mr. R. Giffen, as controller-general, Mr. L. Smith (author of the "Story of the Dockers' Strike,") as chief commissioner, and Mr. John Burnett, as chief labor correspondent. As an evidence of the sincerity on the part of the Government to prosecute the aims elucidated by Hon. Mr. Mundella, it may be observed also that the publication of the *Labor Gazette* has been begun, while Mr. Burnett and a colleague have been commissioned to the United States to inquire into and report upon certain phases of the labor movement and matters incidental thereto in that country.

UNITED STATES DEPARTMENT OF LABOR.

[Abstract of Précis of Evidence of Dr Elgin R. L. Gould, of the United States Labor Department, given before the Royal Commission on Labor, Great Britain, 1892-3.]

Dr. Gould, as statistical expert of the United States Labor Department for the preceding five and a half years, in reply to certain questions pertinent to the statistical systems of the Republic, said that

"In connection with the federal government of the United States there are six cabinet offices or departments, and under each department there are grouped different bureaux having different functions. The Department of Labor was originally created in

1885 as a bureau under the Department of the Interior; but in 1888 it was placed into an independent position, though without being raised to the dignity of a cabinet office. By this arrangement the Commissioner of Labor, as the chief of the department is called, has the double advantage of being responsible to the President of the United States and of being at the same time independent of the vicissitudes of party warfare for continuing in office. By the law of 1885 the functions of the department were set forth as follows: 'There shall be at the seat of government a Department of Labor. The general duties of the Commissioner of Labor are to acquire and diffuse amongst the people of the United States useful information on subjects connected with labor, in the most general and comprehensive sense of that word, and especially upon its relation to capital, the hours of labor, the earnings of laboring men and women, and the means of promoting their material, social, intellectual and moral prosperity.'

"The same law goes on to specifically oblige the commissioner to issue a report every year, but leaves him to choose its subject. He is also permitted to issue additional reports on his own responsibility, such as the report on the Scandinavian liquor legislation (upon which the witness is at present engaged); but with this exception the only special reports yet issued have been drawn up at the invitation of Congress.

"In conducting its inquiries the department keeps in view the following principles: First, to collect all information at first-hand through the personal investigation of one of its own accredited agents. Secondly, to procure for this purpose the services of skilled experts, who, previously to conducting their inquiries, shall have set themselves to study the subjects which they are about to investigate with a view to ascertaining what information is required, and what information is possible to obtain. Thirdly, to avoid making specific recommendations, but simply to publish the facts and leave the public and the persons interested to draw their own conclusions.

"The first annual report issued by the department was on the subject of industrial depressions. It was a study of the various commercial and industrial crises from 1815 to 1885. The second annual report was on convict labor. It was the result of an inquiry into the effects of the different systems of employing prisoners practiced in different States. The third report was on strikes and lockouts for the five years 1881-6. The fourth was on the social condition of working women in the larger cities. The fifth was on railway labor, and the sixth, published nine or ten months ago, was on the cost of production in the iron and steel industries.

"In addition to these annual reports on subjects chosen by the Commissioner of Labor, Congress has twice ordered the department to conduct special investigations, the first on marriage and divorce statistics in the United States for the 20 years ending in 1887, and the second, the result of which is shortly to be published, on the progress of manual training and trade organizations in the United States and Europe.

"For the financial year 1891-2 the permanent staff of the department consisted of 75 persons, 55 of whom formed what may be called the interior and 20 what may be called the exterior staff, the latter consisting of special agents employed outside the office in the investigation of certain subjects. The total appropriation for the same year, exclusive of the bill for printing the annual reports, for which a special appropriation is made in proportion to the bulk of the volumes issued, was $168,720, or about £33,600. Of this sum, $191,020 were expended in salaries to the permanent staff, $47,500 in travelling and subsistence allowances and in the salaries of temporary employees, $5,000 in rent, $1,000 in stationery, $250 in postage to foreign countries, $3,000 in extra printing and binding, etc., $1,000 on the library, and $4,000 in miscellaneous items, such as furniture, advertising, telegraphs and telephones, expressage, fuel, lighting, etc. When Congress orders the department to conduct special inquires it makes special appropriations to meet the expenses connected with them; $22,500 have been so appropriated in in connection with the two special inquiries already made by order of Congress.

"The United States Department has been the means of substituting inquiry by a skilled permanent body for inquiry by committees of the Legislature, much to the general advantage. It has provided the country with a body of trustworthy statistical information in the absence of which the people would be certain to use statistics that were not trustworthy.

"In addition to the Labor Department of the Federal Government, labor bureaux have been established in 27 of the States. Of these, the oldest is that constituted in the State of Massachusetts in 1869. In 16 States, viz.: California, Connecticut, Indiana, Iowa, Kansas, Maryland, Massachusetts, Michigan, Nebraska, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota and Utah, the functions of the labor bureaux, like those of the United States Department, are purely statistical. In 7, viz.: Illinois, Maine, Minnesota, Missouri, Rhode Island, Tennessee and Wisconsin, the control of mine and factory inspection is added. In 2, viz.: Idaho and [New] Mexico, certain duties in regard to emigrants are assigned; and in 2, viz.: Colorada and North Dakota, the Commissioner of Labor is obliged to intervene on the petition of 15 of the workmen in the event of a strike taking place at a firm employing 25 or more hands. The State bureaux follow the same principles of conducting their inquiries as the United States Department, as far as their means allow; but in many cases they cannot afford to send out agents to collect information at first hand. Unfortunately, too, the Labor Commissioner's tenure of office depends, in many of the States, upon the continuance of a particular political party in power.

"There is absolutely no organic relation between the State bureaux, *inter se*, or between them and the United States Department, and owing to the strength of the sentiment of State autonomy it would be impossible to institute any such relation. Up to the present time the United States Department has not called upon the State bureaux to supply it with information; but the State bureaux have made such communications to each other, and every year a convention is held of the various labor commissioners of the various States in order to discuss matters of common interest.

"All the State bureaux originated in response to the directly expressed wishes of the principal labor organizations, each of which has a legislative committee formed for the purpose of urging the passage through the State Legislature of enactments in which it is interested. These committees have always bestowed part of their efforts upon securing liberal appropriations for the labor bureaux.

"The United States Department reporting to the Federal Government does not make recommendations as to labor legislation, etc., because to do so would be considered an infringement of the prerogatives of the separate States to whom the formation and administration of the industrial codes, except in relation to *employees* of the Federal Government, solely belong. But it is clearly within the province of the State bureaux, reporting to the State Government, to do so, and they frequently do exercise this function.

"It would in all cases be better to confine the functions of a labor department or bureau, wherever established, to the compilation of statistics. In exceptional cases indeed it is advisable for the head of such a department to intervene in a dispute; but he should always be allowed to use his own discretion in so doing, and should not be fettered with any legal obligation in the matter. Under no circumstances, moreover, should he be empowered to issue an award. His interference should be limited, as is the case in Colorada and North Dakota, to the task of mediation, that is to say, to the work of a peacemaker without power of adjudication. A parliamentary head of a labor department might be tempted to utilize his power, as arbitrator, if such power were conferred on him, for the benefit of the class that possessed the greatest influence in the political party for the time being in power.

"Although there are only two of the State labor bureaux that are charged with the duty of mediation, there are in several of the States boards of arbitration established as separate departments."

UNIONS AND SYNDICATES IN FRANCE.

Since the enactment of the law of 1884, legalizing the formation of commerical, industrial and trade associations in France, upwards of 1,300 such bodies have sprung into active existence in that country. They are usually classed as agricultural employers, industrial syndicates, workmen's industrial syndicates and mixed syndicates. Laborers are not, as a rule, taken into the agricultural syndicates; nor is there any general combination against labor on the part of the employers' syndicates. The agricultural syndicates

have been mainly useful as a means of protecting the farmers from fraud in the purchase of fertilizers and other supplies; the employers' syndicates have managed to keep prices up in certain lines of business, but the efforts in this direction have not been generally successful enough to excite either comment or alarm.

Trades Unions.

Mr. A. Condie Stephen, in his elaborate report to the British Government on the labor question in France, in referring to the trades unions in that country, says:

"The first thing that strikes attention in examining the statistics of workmen's trade unions is the disproportion between the number of syndicates (1,250) and the number of members (205,152). According to the opinion of those best qualified to judge, the percentage of syndicated workmen does not at present exceed 6 to 7 per cent. On the other hand, that their number is gradually increasing there cannot be any doubt; but up to the present time the desire on the part of the working classes to join these institutions has not been at all in proportion to the alacrity displayed by the advocates of unions in forming them. This may be accounted for in two ways—either French workmen in the mass are generally skeptical as to the practical personal advantages to be obtained by such associations or the individualism referred to is still very strong in French nature and disinclines a good workman in times of prosperity to restrict his freedom of action by obligations which, though perhaps conducive towards raising the wages of his neighbor, may, for all he knows, steadily lower his own. It is difficult, in a highly vigorous nation, where some skilled workmen can occasionally earn by individual energy from 15 to 20 francs a day, to rapidly convert the laboring population to more than a lukewarm belief in in the merits of unselfish combination, particularly where the whole question is mystified and complicated by countless political and social considerations which they do not understand. It is interesting to note how many employers, to whom it is essential to get work punctually done, having been quick to observe such hesitation on the part of their best workmen, have indisposed them for and prevented them from joining unions by the encouragement they have given to personal energy and by the judicious distribution of gratuities. But, although the total amount of workmen already syndicated is comparatively small (the average number in a syndicate is about 164) the network which has been formed is widespread and very formidable; and these syndicates may be regarded as half empty *cadres* into which the vast labor forces of the country could at any moment be drafted.

"The well-to-do-workman, in fact, approves at present of the 1,250 syndicates, with their well-planned organization and extensive ramifications, much in the same way as an equipped standing army, to which he does not think it necessary to attach himself while all goes well. Were bad times to come and good and steady workmen, as well as bad ones, to be thrown out of work, it is more than likely that the numbers would soon rapidly swell; for, though still shy of combination in practice, the majority may be said to have been thoroughly won over to it in theory. What they would probably like would be to employ it as an occasional weapon against their masters, whenever they saw an immediate personal advantage to be derived from its use. Moreover, trade unions and strikes are still so inseparably connected in the mind of a Frenchman that to belong to the former seems necessarily to involve an immediate and unavoidable resort to the latter, and, as the majority regard strikes with disfavor, it is probable that, while trade continues, the violent language of noisy extremists will prevent the syndicates filling as rapidly as they would if the policy preached were a little less militant. This cautious behavior and reluctance to commit themselves is perhaps also due, in some measure, to the remarkable common sense of the French lower classes. That their influence, as a rule, is used towards deterring workmen from joining syndicates is probable, and it is interesting to observe, in talking with them how shrewdly they seem to have grasped the situation and how needless they consider it to make personal sacrifices or unnecessary financial risk when the tide of itself is running so high in their favor."

Mr. F. B. Loomis, United States Consul at St. Etienne, in France, is his report dated November 28, 1892, to the Secretary of State, says that the foregoing quotations from the report of Mr. Stephen on the labor question in France would give an inaccurate view of the

situation "if he had nothappily called attention to the fact that, notwithstanding the limited membership of the workmen's syndicates, their effect upon the minds of the working classes is enormous. Every large employer realizes this and understands what the power of organized labor would be if discontent became general and a majority of the working people went into the syndicates and arranged themselves against capital."

Mr. Loomis also says in explanation that "the aim of the workmen's syndicates is to secure high wages, to assist members out of work and to find employment for them without charge. The fee for becoming a member of one of these organizations is generally 15 or 20 cents; the dues vary from 10 to 30 cents a month, the larger sum being exacted where there is a benefit fund attached to the syndicate. In some syndicates unemployed members receive a franc or two per day. These syndicates are widely distributed, having been organized in some 325 districts. In Paris there are 167; in Lyons, 107; in Marseilles, 75; in Bordeaux, 61; in Toulouse, 26; in Nantes, Rouen and Roubaix, 20; in St. Etienne, 43."

Catholic Labor Unions.

Mr. Stephen also discusses this phase of the labor movement in France. He says:

"There is another class of syndicates to which it may be well to allude, namely, Catholic syndicates or unions. Since the introduction into France of universal suffrage, and more especially of late, the Catholic Church and the party supporting it have been directing their attention to extending the influence they already possess over portions of the rural community to industrial classes. Whether there be in reality any ulterior political motive connected with this movement is beyond the range of this report to decide, but the most casual observer of existing labor problems cannot fail to be struck with the fact that the two extreme political parties in France, by whatever motive they are actuated, are equally straining every nerve to weld the wage-earners into formidable battalions. Perhaps the distinction between the policy of the two may be described by saying that while the one is endeavoring to convert by holding out prospects of an order of things that may never be realized the other is seeking to enroll recruits by a system of patronage and privilege of which the ordinary workman is prepared occasionally to avail himself without necessarily being converted to the doctrines preached. If kept free from politics, the counteracting effect to the extreme views of this latter may be beneficial, but if on the contrary it should prove that there is a hidden motive it will probably do more harm than good so far as a peaceful solution of the social question is concerned."

United States Consul Loomis takes occasion to remark that

"The foregoing remarks from Mr. Stephen's report to the British Government on the Labor question (in France) do not, in my estimation, do exact justice to the scope and work of the Catholic syndicates. This part of France, which is one of the great industrial centres of Europe, has many Catholic syndicates; they accomplish a great deal in a quiet way for the good of the working people, and I consider them efficient as a barrier against the advancing tide of socialism. The church, so far as I can learn, organizes these unions on a practical, liberal scale, and invites the working people to make them their own and enjoy their benefits."

Labor Exchanges.

As one of the results arising out of the development and growth of labor unions in France, labor exchanges (*Bourse du Travail*) have been erected in many centres of population. In Paris the exchange is a municipal institution. The building in which its business is transacted cost about $600,000 and the exchange receives, in addition, a sum of $10,000 per annum to defray expenses, supplemented by some small gratuities. Last year this exchange in Paris found employment for some 29,000 workmen. It is also to its credit that it is conveniently arranged and that its internal affairs are well managed. It has two hundred and twenty syndicates attached to it.

Councils of Prud'hommes.

The councils of Prud'hommes or experts, and which numbered 166 in 1891, are of legal creation. Each council is divided into two committees, of which one is termed the bureau of consultation, the other the bureau of judgment. The duty of the first bureau is to effect a conciliation, if possible, between the contending parties. In the event of failing to do this the case goes to the judgment committee for settlement, and where the sum involved is under $40 there is no appeal from the judgment of this committee.

The bureau of conciliation is composed of two members—one an employer, the other a workman—chosen from different industries. They preside in rotation and meet at least three times a week. The secretary calls the cases in the order of their enrollment. Default in appearance is not ordered till one hour after the time of meeting. If in any event those composing the bureau of conciliation do not feel competent to decide a case before them it may be referred to an expert. When both parties have been listened to the two prud'hommes do what they can to effect an agreement. They have power to compel the production of witnesses and documents. This committee as a rule deliberate before proposing a plan of settlement If the settlement proposed is accepted by the parties affected, the secretary draws up the conditions agreed upon and the president insists upon their honest fulfilment.

In the event of failure in bringing about an agreement the case is referred to the committee of judgment, to the secretary of which body it is submitted in writing. The bureau of judgment is composed of not less than two workmen and two employers—equal numbers being essential. This bureau meets once a week and more frequently if deemed necessary. If either of the parties summoned fails to appear at the time indicated he is judged by default. When the respective parties are called they are heard in turn and the president questions them. After the case has been stated the council of prud'hommes comes to an understanding in secret as to the verdict to be rendered, and the secretary draws up the judgment and it is binding. In cases involving a larger sum than $40 appeal can be made to the tribunal of commerce.

It appears to be an admitted fact that the tribunal of prud'hommes has been of much service in reducing the volume of litigation, promoting a better feeling between employer and employee and in saving money. During the year 1891 the one hundred and sixteen councils of prud'hommes in France disposed of sixty thousand cases. On an average about 70 per cent. of cases are settled by the committee of conciliation and about 30 per cent. are dealt with by the bureau of judgment. As at present constituted the councils of prud'hommes are called into existence by Government decree on the request of the local chambers of commerce, and have jurisdiction over disputes between employers and employees in the metal, textile, chemical and building trades.

Higher Council of Labor.

This body was organized in 1892 and consists of fifty members, who are chosen from members of parliament, workmen, employers, syndicates, councils of prud'hommes, and experts on economic questions. Besides these, the director-general of public works for Paris, the president of the municipal council of Paris, the director of local commerce, director of technical instruction, commissioners of railways, and other public functionaries who have to deal in a particular way with the labor problem, are members *ex officio*. This council meets at the call of the Minister of the Interior, and its main function is to deliberate upon and throw all possible light on such phases of the labor question as may come before the parliament of France for discussion.

A Labor Bureau.

A Labor Bureau, in connection with the Department of Commerce, was also organized by law in 1892. Its functions are to collect, edit and publish statistics bearing on the relations between capital and labor, and the work is to be non-partizan and without bias. It will neither argue nor offer conclusions—merely state facts. The present cost of this bureau is about $30,000 a year.

Laws Concerning Women and Children.

According to the provisions of a law enacted last year, after January 1, 1893, no children less than 12 years of age can be employed in workshops or factories, children under 16 may not work more than six hours per day, children between 16 and 18 shall not work more than 11 hours per day. The law also provides that there shall be recesses during the day amounting in the aggregate to sixty minutes. Henceforth no woman or child under 18 years of age can be employed more than six days in any one week, or on any of the legal holidays. Children of either sex under 13 years of age cannot be employed on the stage in theatres in any capacity.

Another law of 1892 prohibits women in workshops and factories who may be in an advanced state of pregnancy from working therein for one month, [before confinement] and provides, at the same time, that the employers shall continue their regular salary during the enforced absence.

Strikes in France.

According to the statistics published by the Government of France on the question of strikes for the year 1889, there were 321 strikes in that country, in which 66,637 workmen took part. Out of these 321 strikes there were 33 in which the workmen secured an increase of wages, 63 were compromised, and in 166 cases no definite results were obtained.

From 1852 to 1889 (inclusive) there were 1,813 strikes in France. Out of these 539 were among weavers, 157 among spinners, 109 among metal workers and 88 among miners. In the majority of these cases the strikes were the result of demands for increased wages or by refusal to accept lower wages. Of the total number of strikes referred to 163 resulted favorably to the men.

CO-OPERATION AND PROFIT-SHARING.

United States Consul Francis B. Loomis, at St. Etienne, France, in his report to the Secretary of State, dated November 28, 1892, deals at length and ably with the question of co-operation and profit-sharing not only in France but in other European countries as well. He holds that co-operative societies, of which the success has been prodigious in the short time that has passed since their definite adoption by work-people, have already transformed the economical conditions of modern labor. To what do they owe their success? Plainly to the fertile and correct principle on which they are based, that of self-help—what the French call *assistance par soi-même* and the Germans *selbsthülfe*. They are, in a way, the direct application of the great principle of mutuality, to the success of which the world of to-day renders homage. The time has long gone by (1850) since M. Thiers, the eminent French statesman, said that workmen's associations were nothing else than anarchy in the commerce of the country. The fallacy of that assertion has been proved to-day, as co-operative societies have received at the hands of political economists a very warm reception for the last thirty years, who have given them a large place in their writings. Co-operation, as understood in France—or in any other country—has nothing in common with the doctrines of Saint Simon, Fourier, and other so-called reformers. If it be a species or degree of socialism, it is that bearing the stamp of the Academy of Social and Political Science; it develops and produces fruit without the intention of working harm to the fundamental principles of social order. Such is the opinion of those great political economists, B. Bandrillart, Wallaski, Horn, Claval, Charles Robert, Cheysson, Charles Gide and others. It is, in short, that of all those who have at heart the future of co-operation, of those who are at the head of the movement and whose desire is to break down the antagonism existing between capitalists and laborers.

Elsewhere in Europe, as in France, all those who are not more in favor of revolutionary utopias than of state socialism, consider co-operation and profit-sharing as the best means of transforming the social conditions of the people. At a conference held at Nimes in 1883, M. de Boyne, in a speech advocating co-operation, said :

" The co-operative system has nothing in common with communism, which is but state tyranny in its most aggravated form. The aim of communism is to convert the community into a gigantic workshop, from which would be banished all individuality and responsibility—it is the negation of co-operation. This latter encourages production and develops economy, while communism paralyzes the one and discourages the other in substituting the action of the state to that of the individual. Co-operation makes men, trusting in themselves ; communism makes children, who remain all their lives in tutelage."

" Every century has had one or more problems to solve. The present one has to solve economical and social questions, but the solution will not be furnished by revolutionary socialists, nihilists, anarchists or other violent demagogues. Their aim is not to build, but to demolish ; hatred of anything that exists is their principle ; negation of the right to possess, of all religious sentiment, of the liberty of man, destruction and carnage, is their programme. Practical socialists and co-operators do not desire to throw down but to build, and they hope thus to peacefully succeed in resolving many social difficulties Associations of workmen to improve their material, intellectual and moral situation is their principle ; the right of capital to receive an interest in proportion to the risks incurred, an equitable division of the profits of production between those who have contributed to realize them, either by intellectual power or by talent, or by manual effort, liberty of conscience, love and fraternity is their programme."

Some years after M. Charles Gide, a distinguished professor of political economy at Montpelier, in dealing with the same subject, drew a very distinct line between co-operation and collectivism, in the following terms :

" We differ from the collectivist party on two important points. The first is that we see no necessity to abolish individual property, even in instruments of production ; we desire, on the contrary, to be able by association to make the workman the owner of such instruments. The second point wherein we differ from collectivism is that we entertain a certain distrust of the state, of the government of authority, of societies with a capital S, although we admit the intervention of the state as regards the protection of the individual, yet we do not believe much in the efficacy of law in the creation of a new social order. We are a little afraid of this great collectivist machinery, I must confess, which would draw us into its wheels in spite of ourselves. . . . . When I represent to myself the organization of the future society it appears to me under the aspect of a multitude of associations of every kind and proportion, some immense in size and importance, others small, but in all of which the workmen receive the entire product of their labor, because they will possess the instruments of production : associations which suppress middlemen, because—and yet without suppressing that emulationin dispensable to all progress—they will attenuate competition and strife by suppressing the cause of all conflicts. . . . . Such is my dream, and I hope it is also yours. I have been frequently reproached with looking at co-operation in the far perspective and not, as some would have it, in the near future. The criticism may be merited, but the people must not be lulled by chimeric delusions. I believe in co-operation, but it can not be built up nor adopted in a day."

The principle of co-operation is generally recognized and dealt with under the following heads, viz. : Co-operative association for supplies, which permits the co operator to procure for the wants of his family the best food at low prices ; loan societies, the design of which is to lend to short purses a certain amount of capital on the most favorable conditions possible ; societies of production and distribution, which permit the workmen to increase his daily salary by a part of the profits which habitually belonged to the employer.

As to profit-sharing, M. Charles Robert gives, perhaps, the best definition when he says " it is an agreement, express or tacit, by which the employer gives to his workman, in addition to his regular salary, a share in the profits, irrespective of losses." In view of the fact, however, that almost everywhere in which profit-sharing prevails the workers are given to understand that it is only by reason of the generosity of the employer that they are

allowed to share the profits, a strong point is made as accounting for a certain amount of apathy and objection to the system on the part of workmen, which finds expression in the assertion that they ought to have a right to some portion of the profits, and not be put in the position of accepting a gift when they receive their share of them.

France.

The first societies of supply in France date from 1848. In 1851 there were 38 in that country, but with the advent of the Empire they were dissolved. The year 1892, however, found some 1,100 in existence, with a membership of about 600,000. Until quite recently co-operative societies were not as successful in Paris as they were found to be in the provinces. Now, however, several in that city are reported as very prosperous and the volume of business transacted considerable. Last year all these supply societies formed a federation with M. Clavel as president, and M Charles Robert as secretary.

There are only about eighty societies of production throughout all France, and of this number forty are to be found in Paris.

In spite of most active efforts in that direction only eighteen loan societies exist, of which the principal are those of Paris, Angers, Mentone and St. Chamond (Loire). The only co-operative building society is to be found at Marseilles, and bears the name *Pierre du Foyer*, or "hearthstone."

England.

For all practical purposes only three classes of co-operation exist in England, and these may be rated as societies of production, supply associations and building societies. The loan societies are not, properly speaking, co-operative, and are spoken of as diminishing in number.

The societies of production, which obtain for the workman all the profits of his work, are 106 in number, with 27,528 members, and a paid-up capital of $3,478,100.43, and $1,338,198.08 deposited.

One would be justified in saying that the English working class has had for its principal object the solution of the problem of co-operation in supplies. As early as the year 1777 a co-operative workshop was opened in Birmingham, and in a few years afterwards another at Wengeve by the the Bishop of Durham But the movement did not distinctly take hold of the classes until 1848, when the Rochdale Pioneers was founded. This society progressed rapidly, owing to the active collaboration of Kingsley, Vansittart Neal, John Stuart Mill and others. The society was founded by a few workmen out of work, who had only a very limited capital to commence with. In 1882 the society reckoned 10,613 members, and possessed a capital in shares of $1,424,815.90; in 1889 the net profits exceeded $242.282.50. At the close of the year 1892 this society possessed twenty co-operative stores in the town of Rochdale alone.

The total number of supply stores was, according to last statistics, 1,516, of which 1,170 were in England and Wales, 334 in Scotland, and 12 in Ireland. The number of members was 967,828. The capital in shares was $50,327,672.05 and $11,023,615.12 were deposited. The business transacted during 1887 figured for the sum of $167,935,964.77, and the value of goods in stock was $212,336,168.72, giving a profit equal to $16.55 to each member. In 1883 the co-operatives created by shares the wholesale co-operative society, with its headquarters in Manchester. This society made marvellously rapid strides; it created a transport service between England and France, and an insurance company for its buildings, its ships and its goods. It possesses its own manufactories of soap, boots, biscuits, etc. On the 31st of December, 1888, it had a membership of 634,196.

Each year the delegates of the different co-operative societies hold a congress, and, according to the balance sheet made out in 1890, the situation was as follows: Societies belonging to the union 1,621; number of members, 1,074,724; capital and deposits, $71,549,027.04; reserve fund, $2,991,884.50; grants for education, $126.361.89; value of buildings, $28,931,267.44; net profits, $18,467,137.40.

In 1890 there were 1,940 building societies in England, with a membership of 600,000. The receipts for that year rose to $92,530,000, and they had lent on mortgage $253,240,000, giving a total of $345,770,000.

Germany.

In 1890 there were 5,950 co-operative societies in Germany—loan societies, 2,988; industrial societies, 2,714; supply societies, 760; and 28 building societies. The industrial co-operative societies are classed as follows: Societies for the purchase of raw material for different trades (shoemakers, tailors, carpenters, wheelwrights, locksmiths, blacksmiths, weavers, tanners, etc.), 113; societies for the purchase of everything appertaining to agriculture, 843; societies of butchers, 9; co-operative stores, 59; co-operative manufactories, 138; for agricultural produce (milk, cheese, fruits, etc.), 689.

Italy.

Co-operation is making rapid progress in Italy. While that country had only 250 loan societies in 1883, the number in 1888 had reached 662, and the social capital was 110,000,000 lire. The co-operative stores are nearly as important, while the societies of production—dairymen, masons, carpenters, tailors, shoemakers, etc.—number in the neighborhood of 500.

Switzerland.

Co-operative societies have taken a firm foothold in Switzerland. The supply societies number 138, and their net profits exceed 4,000,000 francs. The most important of these are at Zurich and Geneva. The loan banks number 60. These give a dividend of five per cent.—a small dividend, it is true, but it must not be forgotten that these were not established for speculative purposes, but to lend to those who are in need of a small capital and which it would be difficult for them to secure the use of in any other way.

Belgium.

In Belgium co-operative societies are fairly numerous. That of Liege pays a dividend of from 10 to 30 per cent.; in five years its capital produced 105 per cent. These societies pursue various lines of business: lending money, furnishing guarantees, buying or constructing dwellings, co-operative chemists' shops, etc.

Consul Loomis, in recapitulation of his most valuable data, takes occasion to say that profit-sharing is a French idea. It was in 1842 that Leclaire invented the system and his example was followed by several houses; but it was not until 1864 that the principle was seriously studied and put into practice. Since the year 1872 sixty-eight large business firms adopted it, and for several years the system has become international. The following table shows the number of profit-sharing establishments in the countries therein mentioned:

Countries.	Number.	Countries	Number.
France	92	Portugal	1
Austria	3	Spain	1
Sweden	4	England	62
Italy	4	Denmark	4
Switzerland	16	Holland	5
Germany	26	Russia	1
Belgium	5		
United States	35	Total	255

No doubt the laws which govern co-operative societies in the several countries have a material influence, in favor or otherwise, on the development of co-operation, and a passing reference to such laws may not be uninteresting or uninstructive.

English Law.

English co operative societies are controlled by the Industrial and Provident Act of 1876. The provisions of this law allow societies a choice between that of companies or that of industrial societies. The first have a limited or unlimited responsibility, and in the former case the members are only responsible for the amount of their shares. This form has been adopted by all the co-operative supply associations. Each society must be composed of at least 17 members, and the constitution and by-laws governing must be deposited with the registrar, who delivers a certificate of registration. The capital is composed of shares, of which the number may be limited. The names of the shareholders and the number of shares held by each must be on record in a special registry kept at the office of the society and open to public inspection. Every year a list of all the shareholders, together with a statement of the capital, must be deposited with the registrar. The books are examined by an accountant named by the Home Minister when asked for by a third or a fifth of the members, according to the nature of the society. Ex-members are responsible for one year after they have left the society.

The laws governing industrial and provident societies have a great analogy with that of the friendly societies They are under the control of a regularly appointed registrar, and, in fact, are treated in this respect similarly to the trade unions. The laws governing each society must specify the name of the society, indicate that it is limited, fix the mode of admission and withdrawal of associates, and everything that concerns the capital, the dividends, the administration, liquidation, or dissolution of the society. Industrial and provident societies are exempt from income tax and stamp duties.

German Legislation.

German law as to co-operative societies is mainly derived from the law of 1889. Prior to 1867 the societies formed in Prussia, needing a large credit on account of the doubtful success of the innovation, followed the system of unlimited liability on the part of the members—the creditors could proceed against them either as individuals or collectively. But the Saxon law of 1868 allowed the formation of limited liability co operative societies, and that wise principle was recognized by the German Empire law of 1889. The second article of this law defines the liability of the associates as follows :

"(1) Each of the members is liable on all his goods, not directly to the creditors of tho society itself, and is obliged to furnish to the bank of the society the sum necessary to pay its debts.

"(2) Each member is responsible to the society and to the creditors of the society (unlimited company) for all his goods and property.

"(3) The liability of each of the associates is limited both towards the society and the creditors."

Such are the three clauses which the law recognizes. Articles 6, 7 and 8 declare that lending societies cannot furnish funds to non-members. The administration and control of the associations are also specified by the new law, which in article 51 provides for the annual inspection of the business of each society by an auditor chosen by a certain number of societies assembled in congress ; but this auditor must not be a member of any co-operative society, and his name must be submitted to the approval of the State. Each society must be composed of at least 17 members and a tenth of the shares be paid in before the society is registered. Any member can withdraw on giving three months' notice and can claim his part in the profits of the society, according to the latest inventory. He has no claim upon the reserve fund, however. His liability continues two years.

Belgium's Laws.

The Belgian law of 1873 gives no special definition of co-operative societies. It simply says they are composed of members, of which the number may vary, as well as that of the shares, and that the privileges are inaccessible to outsiders. By this latter provision the transformation of co-operative societies into anonymous companies is ren-

dered impossible, and consequently speculation is avoided. However, if a member withdraws from the society he can give up his share to a third party, provided that he be admitted as a member of the association.

The lowest number of members is fixed at 7, and the administration of the society may be conducted by non-members if thought advisable. This is an important stipulation, inasmuch as through it many intelligent men devoted to the co-operative cause can be chosen outside of the society. The yearly publication of the inventory and balance sheet, abatements, reserve fund, and list of members, with the amount of their shares, is rendered obligatory. The amount of capital is not fixed by law, nor is there any limit placed on the number of shares of each member. If a member withdraws his liability remains in force for six years. The Belgian law is considered both prudent and liberal, and as a consequence co-operative societies have done well in that country.

Italian Code.

The Italian law as to co-operation is somewhat akin to that of Belgium. The amount of shares that each member can possess is fixed at 5,000 lire, as in the English law; but if the capital is divided into shares none of them can exceed 100 lire. A general meeting of the members must be held each year; each member has but one vote, and can represent but one absent member. Every three months the directors of the association must send to the clerk of the court a statement showing the number of new entries, withdrawals, and the total number of existing associates. The association may dissolve itself when the capital has diminished by two-thirds, unless the members, convoked to a general assembly, decide to the contrary.

Swiss Law.

Co-operative societies in Switzerland have almost all adopted the form described under the name of "Association" contained in the Federal code of 1883. The name of "co-operative society" does not appear in that code. To form an association a deed must be signed by seven persons at least and duly registered. The Swiss law does not limit the amount of capital nor the number of members, and leaves the admission or withdrawal of members optional to the parties interested. The liability of the members does not exceed the assets of the association, and in any case cannot extend beyond two years for any member who resigns. A balance sheet must be published every year, and the court advised when the assets are not equal to the liabilities. The dissolution of the society can take place at the request of the court, or of any member, creditor, or other competent authority. After payment of the liabilities the remaining assets, if any, are divided among themselves.

Past, Present and Proposed Law in France.

In the past, and up to the end of 1892 at least, the co-operative societies in France were subject to the law of 1867, which did not intend to create a new and particular form of society, but to modify in certain points the ordinary regulations applied to societies got up by shares. The capital was divided into shares of 50 francs each, instead of 100 or 150 francs as in other societies; and the tenth part only, instead of the fourth, is required to be paid up before the society can be registered. The initial capital was limited to 200,000 francs and the possible annual increase to a similar amount. Such were the salient features of the law. While it contained nothing relative to the entry or withdrawal of members, the societies were obliged to conform to the obligations exacted of anonymous societies—publications of constitutions and by-laws in the daily press, registration at the office of the clerk of the court, taxes, stamp duties, and other fiscal exactions—which discouraged co-operative enterprises. Consequently while the co-operative movement progressed rapidly in other countries it was retarded in France by defective legislation, and especially as concerned co-operative supply associations.

The existing law (1892) exposes co-operative societies, and other societies of like character, to all manner of difficulties, sometimes even to ruinous procedures with the financial administration of the State, and yet gives them no definite legal status. It is

for this reason that a certain number of co-operative associations have adopted the anonymous forms, for if French jurisdiction admits that a society can assume one of the commercial forms, it exacts in each case the fulfilling of all the prescriptions of the law of 1867, which constitutes an expense to the society of at least 400 francs; besides this they have to pay stamp duties, a tax on the revenue of each share, wine and liquor licenses, and those on wholesale and retail.

Article 49 of the law of 1867 limits the initial capital to 200,000 francs and allows an annual increase of a similar sum; but this legal maximum is not sufficient for certain co-operative societies, such as building societies. Societies of production labor under the same difficulties.

A new Bill will be legislated upon in 1893, and in which special attention will be devoted to overcoming the defects of previous legislation in respect of profit-sharing and co-operation.

FREE PUBLIC EMPLOYMENT OFFICES.

Pennsylvania.

While the State of Pennsylvania in the Republic of the United States was the first to establish a Bureau of Labor Statistics in the year 1872, it remains to the credit of Ohio as being the first State to create free public employment offices in connection with the Bureau of Statistics. As these free public employment offices are the only ones in existence on this continent at the time of writing, some knowledge of their creation, mode of operation and the results and advantages, as well as their defects, as developed through experience, will not be out of place here.

Ohio.

On the 28th day of April, 1890, the House of Representatives and Senate of the State of Ohio enacted as follows:

An Act to amend section 308 of the Revised Statutes of Ohio.

Section 1. Be it enacted by the General Assembly of the State of Ohio, that section 308 of the Revised Statutes be so amended as to read as follows:

Section 308. The commissioner shall have an office in the State House, which shall be a Bureau of Statistics of Labor, and he shall collect, arrange and systematise all statistics relating to the various branches of labor in the State, and especially those relating to the commercial, industrial, social, educational and sanitary condition of the laboring classes. Said commissioner is hereby authorized and directed, immediately after the passage of this Act, to organize and establish in all cities of the first class and cities of the first and second grade of the second class in the State of Ohio, *a free public employment office* and shall appoint one superintendent for each of said offices to discharge the duties hereinafter set forth. Said superintendents shall cause to be posted in front of their said offices on a sign board, or in a suitable place on the building where such offices are located, the words "free public employment offices." It shall be the duty of such superintendents to receive all applications for labor of those desiring employment and those desiring to employ labor, and record their names in a book kept for that purpose, designating opposite the name of each applicant the character of employment or labor desired, and the address of such applicant. Each of said superintendents shall be provided with such clerical assistance as in the judgment of the commissioner may appear necessary for properly conducting the duties of their several offices. No compensation or fee shall, directly or indirectly, be charged to or received from any person or persons seeking employment, or any person or persons desiring to employ labor through any of said offices. Said superintendents shall make a weekly report on Thursday of each week to said commissioner of all persons desiring to employ labor and classes thereof, and all persons applying for employment through their respective offices and the character of employment desired by each applicant, also of all persons securing employment through their respective offices and character thereof, and a semi annual report of the expense of maintaining such offices. Said com-

missioner shall cause to be printed weekly a list of all applicants and the character of employment desired by them, and of those desiring to employ labor and the class thereof, received by him from the respective offices aforesaid, and cause a true copy of such list on Monday of each week to be mailed to the superintendent of each of said offices in the State, which said list by the superintendent shall be posted immediately on receipt thereof in a conspicuous place in his office, subject to the inspection of all persons desiring employment. Said superintendent shall perform such other duties in the collection of labor statistics as said commissioner shall determine. Any superintendent or clerk as herein provided who directly or indirectly charges or receives any compensation from any person whomsoever in securing employment or labor for any other person or persons as provided in this Act, shall be deemed guilty of a misdemeanor and be fined in any sum not exceeding fifty dollars and imprisoned in the county jail or workhouse not exceeding thirty days. The superintendent of each of said offices shall receive a salary, *to be fixed by the council of such city*, payable monthly. The clerk or clerks required in any of such offices shall receive a salary of not more than fifty dollars per month, provided that the compensation of such superintendents and clerks so appointed shall be paid out of the city treasury in which such free public employment office may be located.

SECTION 2. That said original section 308 of the Revised Statutes be and the same is hereby repealed.

SECTION 3. That this Act shall take effect and be in force from and after its passage.

State Commissioner John McBride, in his annual report on labor statistics for the year 1890, referring to this Act creating free public employment offices in Ohio, and his work as authorized thereby, takes occasion to say:

"The objects sought to be obtained by the law are good, but the law itself is one of those curiosities which are sometimes born of loosely constructed or hastily considered legislative enactments. The law, it will be observed, both authorized and directed the commissioner to proceed immediately to organize 'Free Public Employment Offices,' and to appoint superintendents and clerks for the same.

"To organize the offices necessitated the securing of salaries for those who were to fill them, and as the law provides that salaries shall be paid out of the treasury of the several cities in which the offices are located, yet leaves it optional with said cities as to whether they shall or shall not pay, I sent certified copies of the law to each of the city councils and, either in person or by letter, asked that an ordinance be passed fixing salaries of superintendents and clerks. All of the cities complied with my request, although some of them were late in doing so, and Toledo only provides for a superintendent."

After stating that free public employment offices were established in the cities of Toledo, superintendent, salary $1,000 per year; Cleveland, superintendent $1,200, female clerk $600; Dayton, superintendent $1,000, female clerk $600; Cincinnati, superintendent $1,200, female clerk $600; and Columbus, superintendent, $1,200, female clerk $600, Mr. McBride said that there being no provision made by the Legislature for expenses, other than salaries connected with free public employment offices, and not knowing whether the law contemplated that the State or the cities should defray them, he tells his readers that he wrote the State Attorney-General pointing out the circumstances and requesting a deliverance thereon. In replying, the Attorney-General said:

"I have examined the Act to which you refer, and while its provisions are not as plain and positive as they should have been, I am, nevertheless, of the opinion that the spirit of the Act requires the State to pay the necessary expenses connected with the establishment of 'Free Public Employment Offices,' except the salaries of superintendents of such offices and clerks in the same."

On the strength of this opinion the Governor of the State authorized the commissioner to create a deficiency in the sum of $2,000, being the estimated sum required to meet such expenditure, and to the extent of this sum offices were rented and furnished.

The commissioner in elaboration, continues as follows:

"In making appointments I selected men for superintendents and ladies for clerks. This was done because of the belief that women and girls out of work would prefer to approach one of their own sex when in search of employment. The wisdom of this course has since been demonstrated by the operation of the offices.

"As the law now stands the commissioner has the power to appoint, but has no authority to remove the superintendents and clerks. This evidently was an oversight, but it should be remedied so that the good work of the different offices may not be interfered with by the bad services of an appointee. Another bad feature of the law is that which leaves it optional with councils of the different cities to make and unmake salaries. This provision endangers the existence of the offices and has a tendency to bring the superintendents and clerks into collusion with members of the city governments as against the commissioner.

"During the short time that the 'Free Public Employment Offices' have been in operation the superintendents have rendered material assistance to this bureau in the way of collecting statistics, yet if the employment offices are to continue as auxiliaries to the bureau, the State should either assume all expense in connection with the offices or make it obligatory upon the city governments to do so.

"The superintendents of the 'Free Public Employment Offices' are required by law to report to this bureau on Thursday of each week the work done by them during the preceding week. The reports commence with the appointment of superintendents and are given as reported weekly. 'Situations wanted' means those wanting work to do; 'help wanted' refers to employers wanting employees; and 'positions secured' indicates the number who have secured work through the office.

REPORT OF TOLEDO OFFICE FROM JUNE 26, 1890, TO JANUARY 1, 1891.

		Total.
Situations wanted	Males	2,334
	Females	719
Help wanted	Males	2,885
	Females	1,083
Positions secured	Males	1,329
	Females	497

REPORT OF DAYTON OFFICE FROM JUNE 30, 1890, TO JANUARY 1, 1891.

		Total.
Situations wanted	Males	2,944
	Females	1,083
Held wanted	Males	1,384
	Females	878
Positions secured	Males	399
	Females	418

REPORT OF CLEVELAND OFFICE FROM JULY 1, 1890, TO JANUARY 1, 1891.

		Total.
Situations wanted	Males	2,523
	Females	1,277
Help wanted	Males	3,189
	Females	1,231
Positions secured	Males	1,333
	Females	847

REPORT OF CINCINNATI OFFICE FROM JULY 25, 1890, TO JANUARY 1, 1891.

		Total.
Situations wanted	Males	4,763
	Females	1,818
Help wanted	Males	2,803
	Females	2,787
Positions secured	Males	1,830
	Females	1,126

REPORT OF COLUMBUS OFFICE FROM SEPTEMBER 2, 1890, TO JANUARY 1, 1891.

		Total.
Situations wanted	Males	1,965
	Females	710
Help wanted	Males	1,192
	Females	722
Positions secured	Males	684
	Females	525

"The total number of persons wanting situations was 20,136, and of this number 14,529 were males and 5,607 females. The total number of employees wanted by employers was 18,154, and of this number 11,453 were males and 6,701 females. The total number of persons having secured situations through the offices was 8,982, and of this number 5,575 were males and 3,407 females. The amount of 'help wanted' was 90.2 per cent. of 'situations wanted.' 'Positions secured' was 44.6 per cent. of 'situations wanted.' . . . . . .

"If the 8,982 persons who secured work through the 'Free Public Employment Offices' had obtained employment through the private employment agencies, it is fair to assume that the cost of such services would have averaged $3 per capita for males and $1 for females, or a total of $20,132, and by deducting from the latter sum the cost of maintaining the 'Free Public Employment Offices,' there is a balance of $15,132, which has been saved to the willing, yet poor and needy, working men and women by the State law. This saving in dollars and cents may appear large in the eyes of those not familiar with the patronage given to employment agencies, but as there are at least twelve well known private employment agencies now running in the cities in which the 'free' offices are located, and as many more scattered over the smaller cities of the State, it is evident that nearly one hundred persons live and thrive through the profits derived from such private agencies. This would indicate that nearly one hundred thousand dollars is annually spent by working men and women in efforts to secure employment through the assistance of employing agencies, and if this sum can be saved to the honest toilers of Ohio by the expenditure of about ten thousand dollars annually on part of the State for the maintaining of 'Free Public Employment Offices' that will be run by officials obligated to make honest and energetic efforts to furnish help to employers of labor, and to aid idle labor in securing honorable employment, it should be done.

"Ohio being the first state to create 'Free Public Employment Offices,' their establishment by legislation was looked upon as being an experiment, which many predicted would only be productive of evil results. The friends and advocates of the measure were very sanguine that a trial would demonstrate the utility of the offices in every way, and the result has but emphasized the correctness of their claims. From nearly all States in the union, and from several foreign countries, have come inquiries as to the working of the law, and although copies of the law were sent to all parties who requested them, time and a limited office force would not permit of an extended written explanation, either as to the causes leading to the law's enactment or the result of its practical operation. So much interest has been manifested, however, that I deem it best to give some of the salient points connected with the enactment of this law.

"The Municipal Labor Congress of Cincinnati, an organization composed of all the trade and labor unions in that city, started the agitation in favor of 'Free Public Employment Offices' being established by the State Government in all of the large cities of the State. It was this organization that drafted the Bill which was introduced by Senator M. T. Corcoran, of Cincinnati. The Bill, as drafted and introduced, made the employment offices branches of the Bureau of Labor Statistics, fixed the salaries of superintendents and clerks, and placed the entire expense upon the State. Senator Corcoran and the friends of the Bill fought hard to have it passed in its original form, but the Senate refused to pass it until amended so as to place the expense upon the cities in which the offices were located. The House took a different view of the matter, amended the Senate Bill by substituting the original Bill. The Senate refused, however, to accept the House amendment and the measure went into the hands of a conference committee, which

finally submitted a report embodying the present law, which was adopted by a unanimous vote in the Senate and with but one dissenting vote in the House. The members of the Legislature were of the opinion that inasmuch as the offices were to be located in certain cities, that only those cities would derive the benefit accruing from their labors; hence they believed that the city governments should defray the greater portion of the expense connected with the office. The law, however, is general in its application, and the offices are intended to help employers and employees in all parts of the State. Its prime features provide, first, for the collection of statistical data relating to the industrial interests of the State; second, to assist employers to secure employees; third, to furnish our working men and women, when out of employment, free and reliable information as to the kind and character of employment to be had. By the carrying out of the objects of the law, the collection and compilation of industrial statistics, something in which all our people are interested, will be more complete and the entire State benefited, and the State Government certainly can not undertake a more charitable or a more honorable and praiseworthy act than that of securing employment for her willing yet needy citizen laborers.

"Prior to the establishment of the 'Free Public Employment Offices' there were 'Employment Agencies' in nearly all large cities in this State, but they were run for private profit rather than for public good. They were leeches engaged in sucking the life-blood from the poor. These private agencies charged men and women anywhere from $1 to $15 for securing them employment, and in most cases they demanded and received a price for accepting an application whether they secured a place or not. This every honest-hearted citizen knows to be wrong, because it is evident that when men and women are willing to work, and are unable to find it to do, it is sufficient for them to suffer the hardships which are inseparable from enforced idleness without taxing them for the privilege of securing work, or for the promise to secure work."

In the State of Ohio, where these "Free Public Employment Offices" are in operation, many able and critical thinkers and writers have expressed themselves as very favorably impressed with the principle involved in such a law as that under the provisions of which the offices in Ohio were established.

Hon D. J. Ryan, Secretary of State for Ohio, for instance, gives his views as to the Ohio law in the following letter in the Illustrated Frank Leslie's Paper (New York), dated October 25, 1890:

OHIO'S NEW EXPERIMENT.

The General Assembly of Ohio, on the 28th day of April last, passed a law providing for the establishment of free employment bureaus in the five principal cities of the state, viz.: Cincinnati, Cleveland, Toledo, Columbus and Dayton. The law provides for the appointment of a superintendent by the Commissioner of Labor Statistics, and for such clerical assistance as may be necessary. The primary object of these bureaus is to secure employment for the unemployed and to assist employers in procuring such help as they may apply for, and such other free and reliable information as relates to such applications. An additional duty is also imposed, and that is to collect statistical facts and figures relating to the industrial interests of the respective cities bearing upon employers and employees. Provision is made also for weekly reports to the Commissioner of Labor Statistics, and a consolidated report by him of the returns of all the agencies, which is to be sent by him to each of the five employment offices weekly. The compensation of the superintendent and clerk is to be paid by the city council of the municipality in which the employment agency is established. Superintendents are forbidden, under penalty, from charging or receiving compensation from any applicant to their respective offices.

This law is essentially an "Ohio idea," it being the first of the kind passed in this country, and with the possible exception of the intelligence office in France, there is nothing with which it can be compared. It has for its mission as proper and as legitimate an object of State legislation as can be well thought of—that is, the reduction of unemployed labor to a minimum. Legislation of this character is usually received by the average citizen with distrust and debate. It strikes him as a direct interference of the

State with private affairs, and as being beyond the legitimate province of legislation. Public opinion in Ohio has not passed such a judgment on this law. It has been generally received with approbation in the cities where it has been put into effect. This is due to two reasons: first, that the law is not a piece of political legislation—it passed both branches of the legislature with practical unanimity, receiving with equal strength the support of both political parties. It was as clear and clean a piece of non-partisan legislation as ever passed our General Assembly. The second reason is that the law has been economically enforced, and has proved successful in its operation. I need but give the record of the various agencies to demonstrate this fact. The following tables give the applications for situations and help and the positions secured from the establishment of each office to August 14. Owing to complications arising in the appointment of a superintendent at Columbus, no office has been established at that place at this writing:

Cleveland—July 1 to August 14.

Situations wanted	652
Help wanted	1,031
Positions secured	357

Cincinnati—July 23 to August 14.

Situations wanted	1,831
Help wanted	773
Positions secured	523

Toledo—June 1 to August 14.

Situations wanted	570
Help wanted	1,087
Positions secured	356

Dayton—June 26 to August 14.

Situations wanted	774
Help wanted	698
Situations secured	332

These figures, in the formative and experimental period of the law, augur the richest prospect of success in a short time. It will be observed that fully forty per cent. of all applications were successfully answered. The distinguishing merit of this system is that the information given is free and reliable. As a rule private employment offices are a fraud. They accept fees and applications from all quarters whether there is any probability of filling the demand or not, and in too many cases they have developed into downright swindles. The desire for gain on the part of the proprietors is the greatest temptation to be false to the unemployed. Applications are taken and fees received where there is not the slightest prospect of success in finding the idle workman a place for his anxious hands to labor. On the other hand, applications are received from employers and men and women recommended for work who are useless and without character, so that for the workman on one side it is a swindle, and for the employer on the other side it is a cheat. When the agent of an employment office is clothed with official character, as under the Ohio law, and rendered absolutely independent of the necessity to recommend anybody and everybody and promise anything and everything, we reach the highest stage of success in employment agencies. It is this condition that gives character and standing to the officer in charge.

The incidental reference heretofore made in this paper to the duty of the State to lessen as much as possible the number of the unemployed is the strongest reason for the establishment of free employment agencies. Idle hands are prone to mischief, and the disturbances possible from unemployed labor, willing to work and yet with no prospect of obtaining it, are historical in their danger. As a rule the unemployed gravitate to

the cities, and the larger the city the larger the gravitation of unemployed labor. It is proper, therefore, that these agencies should be established in the great cities of the State, because there they come in contact with the men and women who most need them. The capitalist who owns the mine, the factory or the mill, or the farmer that desires hands for his harvest, can send to this centre of labor and procure the necessary help to carry them through the necessity of their demands.

The present efficient Commissioner of Labor Statistics of this State, Hon. John McBride, gives as his opinion that it is "destined to become one of the most valuable and beneficial laws ever passed in the interest of employers and employees." The prospects justify the opinion, and it needs but a conscientious and faithful discharge of duty on his part to reach the condition which he prophesies.

Are there any objections to the law as it stands in its present shape? Yes; the provision which places in the power of the cities wherein the employment agent acts, to fix his salary, is detrimental to a wholesome operation of the law. It places it at the mercy of municipal politicians and induces official disturbances that will materially destroy its efficiency. The purpose of the law is to benefit the entire people of the State. It is to the advantage of every citizen, whether he lives in the city or the country, that as many men should be employed as possible. Industry and employment conduce to the peace and prosperity of all, and all should bear the expense of a machinery which has that for an object or tends to that end. The expenses, therefore, of salaries and clerical work attendant upon the operation of free employment agencies should be paid from the State treasury and should not be dependent upon the whims of a city council.

Is there any danger in the law? Yes; improperly administered in the hands of men who have not the good of all in view it can become a political machine of advantage to the party in power and an absolute injury to the innocent parties for whose benefit it was established. Happily there are no evidences yet in this State of this danger. The law has been administered honestly and with profit, and the indications are that it will continue to be so. Viewed from every standpoint at this time "Ohio's new experiment" can be regarded as a law which benefits the people at large, and as one which is especially profitable to the employer and the unemployed.

Columbus, Ohio, Sept. 21, 1890. DANIEL J. RYAN.

MICHIGAN.

In the tenth annual Report of the Bureau of Labor of the State of Michigan (1893), Commissioner Henry A. Robinson (since appointed Statistician of the U. S. Department of Agriculture at Washington), in dealing with the subject of "Free Public Employment Offices," takes occasion to say that "in the month of April, 1890, the Government of Ohio established free public employment offices in the cities of Cincinnati, Cleveland, Columbus, Toledo and Dayton, *i.e.*, in five several cities. The idea was borrowed from France, the only government in the world that had adopted that paternal function. It has only one office of the kind, however, which is located in the capital city, Paris, and goes by the name of 'Public Intelligence Office.' Of its workings there we have little knowledge. From Ohio we have considerable data of an *ex parte* nature, however, though official, from which conclusions more or less satisfactory may be drawn. It may be well to say that the facts developed from the Ohio experiment, which to date has extended over a period of three years, were presented to the National Convention of Labor Commissioners held in the city of Denver, May 24, 1892 fifteen States and the United States being represented, with the result that the following resolution was adopted--not unanimously however—by the convention:

"'*Resolved*, That the commissioners of labor of the different States recommend to the legislatures of their different States the consideration of the advisability of creating free public employment offices under State control and supervision.'"

Mr. Robinson continues to say: "It will be observed that the resolution does not commit the commissioners to recommending the establishment of such offices, but merely to call the attention of their respective State legislatures to the 'consideration of the advisability' of creating such offices. In accordance with the instructions of the reso-

lution your commissioner does, therefore, recommend the proposition of establishing such agencies in this State as worthy of the serious attention of the legislature for the reason that, according to the official statements made by the Commissioner of Labor in Ohio, the establishment of such agencies in that State has given almost complete satisfaction not only to the patrons of the offices created but to the public generally. To the former because of the superiority of the services rendered by the State institution as compared with similar institutions operated by private parties for mere personal gain, and to the latter because of certain incidental effects morally and economically beneficial to the public.

. . . . . .

"These figures are official and undoubtedly correct and tend strongly to support the assertion of the commissioner above quoted that the assumption by the State of the function of assisting the unemployed to find employment is no longer an experiment. Of course there are those who are so strongly imbued with the '*laissez faire*' form of government that they cannot tolerate the thought of adding to the functions of the State even the things that possibly can be performed by it better than by private enterprise. Such go so far as to assert that the State can do nothing, or scarcely anything, so well as the same can be done by private parties under the stimulus of competition. However this may be, the modern trend of governments seems to be toward extension of functions. We believe that in the field of governmental science, no less than in other fields, there is still both necessity and room for experiment and the facts herein presented point very strongly toward the advisability of accepting the 'Free Public Employment Agency' as a suitable candidate for trial at least, if not for permanent adoption into the sisterhood of State functions.

"It may be said, in conclusion, that a vast amount of fraud and vantage-taking seems to be indigenous to the business of private intelligence or employment purveyance. A large proportion of those who need to resort to these places for assistance in procuring the opportunity to work are on the verge of necessity, and are in no condition or spirit to parley or resist extortion nor any other form of encroachment upon their rights. Their condition in this respect, if not precisely alike, is at least partially analogous to the classes whose need of and right to public protection and aid is denied by none except the scientific malevolent. That the public is as deeply interested in seeing all who are able and willing to work provided with the opportunity as it is to compel the vagabond classes to comply with the mandate, 'In the sweat of thy brow thou shalt earn thy bread,' goes without saying. How to provide employment for the people is, in these modern times, and even in this great Republic, a question of vital importance. That there should be any idle from need of opportunity to work in a country with a population of less than sixty five millions, whose cultivable area is capable of maintaining in comfort a billion of souls and bodies, is indicative of something radically wrong in the social constitution, of disease which, in the absence of the intelligence to diagnose properly or the courage to apply remedies appropriate to its radical nature, must be treated with some such palliatives as are herein suggested."

Continuing in the train of reasoning engendered in the matter just quoted, Commissioner Robinson, in reviewing the effect of immigration upon the labor market of the United States and the general opinion that a greater restriction thereof would result in steadier employment and higher wages for the working classes in that country, and while combatting the idea of such a movement, feels justified in asserting that "the people of the United States do not desire and will object to receiving cripples and those who are in any way afflicted with contagious or other serious diseases. It is plain that such classes are undesirable both economically and socially. They are consumers and not producers and consequently their presence lessens the average wealth of the nation and burdens the wealth-producing classes with their maintenance. They can do nothing but inflict an injury; they can be nothing but incubuses and poverty producers."

"The true remedy," Mr. Robinson says, "for lack of work and poor wages does not lie in the direction of restricting healthful [European] and natural immigration. . . . What is needed is not restriction on liberty, but the abolition of those restrictions that make the laborers beggars for employment and destroy their manhood from very love of their wives and children. . . . The apparent over-supply of labor arises from a very different cause than immigration. It has its foundation in the fact that the natural outlet to labor is clogged. This outlet is the land. The United States census of 1880 shows that 20 per cent. of those engaged in all the occupations were foreign born. . . . Yet 14 69 per cent. of the farmers and planters were foreign born. This seems to indicate that whenever their finances allow foreigners go upon the land, so that it is safe to assume that were fertile and accessible land practically free a much larger percentage of foreigners than now would go upon the land, thus relieving the congestion in the cities. The bar to the land is its legal possession by those who do not occupy it or work it and who demand toll from everyone who is willing and anxious to exert his strength and intelligence in making it fruitful."

In another part of his report Commissioner Robinson points out that "the people of the United States are paying over $5,000,000 in royalties annually to the owners of certain mines and pine lands for the privilege of working the mines and going upon the lands and cutting down the trees. The divergence of this great sum from natural channels—the pockets of the producers—to unnatural ones—the pockets of the non-producers—must necessarily hamper production and discourage enterprise. As a result there is less demand for labor and in consequence greater competition among laborers, two evils that rest heavily on wage-workers and that seem to prove that there are too many workers in the world and too many good things being produced. Too many good things in the world! What a ridiculous statement! In no one line of human activities are there too many good things. There may be a disproportion of one good thing compared to another good thing but it is not because there are too many of the one but because there are too few of the other. Where there is an apparent over supply of one article investigation will develop an under-supply of others There cannot be too much wheat or too many shoes produced while one person has not tasted white bread or one person goes barefooted. In all probability half the human race does not know what wheat bread is, while another half is innocent of the possession of shoes or anything but the rudest and most primitive kind of foot covering. Make it easy for the people to reach fertile land without paying toll and the immigration flurry will assume its due proportions in the labor problem. The congestion in the commercial centres will find a natural outlet; the manufacturing interests of the land will have broader and better markets for their wares; and mechanics, artisans, tradesmen and laborers alike will feel the throb of quickened commerce; and poor-houses, soup-kitchens, and all kinds of eleemosynary institutions will have to search for patrons on which to bestow their charity. There are dangers from immigration. The workers of each nation have their rate of life, that is to say, their social customs that regulate the cost of rearing a family and supplying its members with those things necessary for their existence and which enables them to 'be as good as their neighbors.' This rate of life regulates the rate of wages. As a rule people will work for what will enable them to keep up this rate. The satisfaction of their desires is obtained by this wage. Now it is plain that were a nation with a high rate of life to be suddenly deluged by intelligent and capable laborers whose rate of life was much lower the competition would bring a hardship on those of more expensive tastes. There are sections of the United States where such a state of affairs has existed. One is California, another is Massachusetts. In the one the Chinese have worked evil to the native American; in the other the French-Canadians have driven those of other nationalities from the cotton factories. The only economic basis for Chinese exclusion is the fact of their slow assimilation; they seem to be the same yesterday, to-day, and forever. Therefore they menace civilization and their exclusion becomes an economic and social necessity. There is no other nation seeking our shores of which this can be said. All others almost immediately raise their rate of life and become as tenacious of their 'rights' as those to the manor born. They acquire more expensive habits and demand a wage sufficient to enable their indulgence. But

under those conditions which would practically give labor unoccupied land free and that would give to society, for society purposes, those values created by the community, the dangers of any trouble arising from a conflict by reason of different rates of life by different nationalities would be reduced to a minimum as no one would work for any one else at a less wage than he could earn working for himself. The employers would be compelled to pay that rate of wage which would satisfy those of the highest rate of life seeking employment in that particular calling; and as the tendency of humanity under natural conditions is to progress the tendency of wages would be steadily upward and the wages paid was the equal in value to the labor performed. This is the highest rate wages can attain. . . . The history of the world tells the story of comparatively high wages, prosperity, steady employment and absence of poverty wherever an intelligent and industrious people enjoy the blessings of a free and fertile soil and an economical and honest government. . . . Not restrictions but liberty is the true remedy for the congestion of human beings in the commercial centres of the land."

Mr. Robinson in a chapter on sociology—socialism, communism, anarchism, and electicism—opens the subject in the following terse language when he tells his readers that "He who to-day shuts his eyes to the human suffering that besets his pathway on every side and who refuses to listen to the cries of distress and the appeals for relief is simply inviting a social cataclysm. This great suffering which seems to be on the increase and which already has assumed alarming proportions, especially in the larger cities of the world, cannot all be due to voluntary idleness of the sufferers. Much of it undoubtedly is due to these, but we must look further for causes when poverty becomes so general that strong men plead piteously for work to relieve the misery of themselves and families, that great brawny fellows ask to be sent to prison so they can get food and shelter, and that men and women commit suicide to escape the gnawings of hunger and the bitter blasts of winter. It is encouraging, however, to see here and there one of the 'better class' recognizing the importance of the solution of the problem of poverty who dares brave the jeers and taunts of the upper tendom and devotes some of his talents to its study and raises his voice in behalf of the burdened masses. There is no lack of remedies proposed for social suffering, but it is the part of the student, the scientist, the men and the women of heart and brain, to carefully investigate and separate the true from the false. All of the remedies proposed cannot be true. There may be some truth in each, and it is the act of wisdom to extract that which is true and make use of it." Then, after a detailed reference to the several phases of the subject which to him seem pertinent, Mr. Robinson concludes with the assertion that "One thing is certain. Great social and industrial changes must occur before long. The monopolization of land, the perfection and use of machinery, the uncertainties of business and employment, and the scarcity and dearness of the mediums of exchange make the lot of the farmer, the mechanic and the merchant precarious indeed. The problems presented for solution require the application and the earnest, conscientious thought and action of the best of our race. Not to solve these problems leaves the future dark and gloomy enough."

Minnesota.

Mr. L. G. Powers, Commissioner of the Bureau of Labor Statistics of the State of Minnesota, in his Third Biennial Report, also deals at length with the subject of "Free Public Employment Offices," and in favor of the principle. In doing so he quotes from a message of the Governor of Iowa. Governor Boies, in the message referred to, says:

"Few of our people are cognizant of the expense to which laboring men and women are often subjected in seeking employment through private intelligence offices. It is not, I am told, unusual for those securing work through these agencies to be required to enter into written agreements by which, in addition to a fee paid when they become an applicant for a position, they are required to pay to the agent a considerable per cent of their earnings for a long period of time.

"In nothing is the State more deeply interested than in the continuous employment of its laboring classes. Any system which would furnish reliable information to both employers and employees could not fail to prove of great value to both. The Com-

missioner of Labor Statistics recommends the establishment of a free employment agency in connection with his office, through which it shall be practicable for those seeking employment and those in search of employees to obtain reliable information without expense to either.

"I most heartily concur in this recommendation. The expense of this office, in connection with the Bureau of Labor Statistics, can be confined within the limits of an appropriation sufficient to pay the necessary stationery and the salary of a single clerk. In my judgment the system should be so extended as to allow cities of the first-class to establish, at their own expense and in their own discretion, like agencies in connection with some one of the city offices, and give them the right to demand of the State office, without expense, information upon any matter of record in that office, which may prove of value in conducting the business of these local offices."

Commissioner Powers also contributes yet another most powerful argument in favor of the establishment of free public employment offices when he points out that "These offices are of great value in lessening the chance of simple country girls being led into lives of shame. As these free agencies become known and trusted these country girls more and more depend upon them, and their liability of falling into the hands of dishonorable villains is greatly lessened. This fact alone commends these institutions to the consideration of all those who are concerned in protecting the innocent and unwary from the wiles of the unprincipled."

Missouri.

Hon. W. C. Hall, Commissioner of the Bureau of Labor Statistics of the State of Missouri, made the subject of free public employment offices an exhaustive study, and in a lengthy report thereon, as operated in the State of Ohio, he says, among other things:

"The practical results of the free employment office may be summarized and recapitulated briefly. . . . In spite of hindrances incident to the establishment of a new departure, without a model on this continent, the percentage of situations secured is gradually getting higher, and the general efficiency of the offices has been in every way advanced. The character of employment provided has been of a better class, and the average skill and intelligence of the applicants materially raised. . . . Viewing labor as a commodity, for the sake of illustration, the system conforms strictly with the plan of dealing with all standard articles on the basis of supply and demand. In order that the largest amount of a commodity may be disposed of with the least possible waste of time and energy, it is necessary that there should be some common ground where supply and demand meet, and where, as near as possible, one may be adjusted to the other. If there were no established places of buying and selling, no public markets, no union stock yards, no boards of trade, all commodities of life would have to be hawked about the streets or await a customer at an established office or private place of business. Such an arrangement would be going backward fifty years, entailing an unnecessary amount of time and energy. Yet, in the absence of the public employment office, he who has the commodity of labor to dispose of must trudge from door to door trusting to chance for a purchaser. His failure to find one is not so often due to lack of demand as to his ignorance of where the demand exists. If there were some source of information to which he might apply, the time spent in looking for employment could be utilized in money-making, and unnecessary waste of time avoided."

Commissioner Hall, in the same connection, also says:

"A great deal might be said from the humane standpoint, where labor is considered something more than a commodity. . . . Next to assisting the unemployed in procuring the means of livelihood, the chief benefit is the protection afforded them from the unscrupulous employment agents, so-called, who prey upon their misfortunes. Their nefarious practices and the great amount of money taken each year from the laboring classes by these leeches in Missouri is fully set forth in the last annual report of this department, and to which I respectfully call attention in this connection, to avoid repeating the information there contained."

SUMMARY OF THE ENCYCLICAL OF POPE LEO XIII., DATED MAY 15, 1891, ON "THE CONDITIONS OF LABOR."

From the *Review of Reviews* for June, 1891.

The figures at the end of each paragraph in parenthesis refer to the pages of the official translation from which the extracts are made.

I. *The Question of the Hour.*

At this moment the condition of the working population is the question of the hour; and nothing can be of higher interest to all classes of the State than that it should be rightly and reasonably decided. (37).

If we turn to things exterior and corporeal, the first concern of all is to save the poor workers from the cruelty of grasping speculators, who use human beings as mere instruments for making money. (26).

II. *Urgency Demanded.*

All agree, and there can be no question whatever, that some remedy must be found and quickly found, for the misery and wretchedness which press so heavily at this moment on the large majority of the very poor. (4).

Every one must put his hand to the work which falls to his share, and that at once and immediately, lest the evil which is already so great may by delay become absolutely beyond remedy. (38).

III. *The Masses little better than Slaves.*

It has come to pass that workingmen have been given over isolated and defenceless to the callousness of employers and the greed of unrestrained competition. That evil has been increased by rapacious usury, which, although more than once condemned by the Church, is nevertheless under a different form but with the same guilt, still practiced by avaricious and grasping men. And to this must be added the custom of working by contract, and the concentration of so many branches of trade in the hands of a few individuals, so that a small number of very rich men have been able to lay upon the masses of the poor a yoke little better than slavery itself. (4).

IV. *Communism not the Remedy.*

To remedy these evils the Socialists, working on the poor man's envy of the rich, endeavor to destroy private property. (4). . . . Their proposals are so clearly futile for all practical purposes, that if they were carried out the workingman himself would be among the first to suffer. Moreover, they are emphatically unjust, because they would rob the lawful possessor. (5). . . . Thus it is clear that the main tenet of Socialism, the community of goods, must be utterly rejected, for it would injure those whom it is to benefit, it would be contrary to the natural rights of mankind, and it would introduce confusion and disorder into the commonwealth. Our first and most fundamental principle, therefore, when we undertake to alleviate the condition of the masses, must be the inviolability of private property. This laid down, we go on to show where we must find the remedy that we seek. (10-11).

V. *Nor Land Nationalization Minus Compensation.*

We are told that it is right for private persons to have the use of the soil and the fruits of their land, but that it is unjust for anyone to possess as owner either the land upon which he has built or the estate which he has cultivated. But those who assert this do not perceive that they are robbing man of what his own labor has produced. For the soil which is tilled and cultivated with toil and skill utterly changes its condition; it was wild before—it is now fruitful; it was barren, and now it brings forth in abundance. That which has thus altered and improved it becomes so truly part of itself as to be in

great measure indistinguishable and inseparable from it. Is it just that the fruit of a man's sweat and labor should be enjoyed by another? As effects follow their cause, so it is just and right that the results of labor should belong to him who has labored. (7-8).

VI. *The Right to a Minimum Wage.*

Wages, we are told, are fixed by free consent; and therefore the employer, when he pays what was agreed upon, has done his part, and is not called upon for anything further. . . . This mode of reasoning is by no means convincing to a fair-minded man, for there are important considerations which it leaves out of view altogether.

Let it be granted that, as a rule, workman and employer should make free agreements, and in particular should freely agree as to wages. Nevertheless there is a dictate of nature more imperious and more ancient than any bargain between man and man, that the remuneration must be enough to support the wage-earner in reasonable and frugal comfort. If through necessity or fear of a worse evil the workman accepts harder conditions because an employer or a contractor will give no better, he is the victim of force and injustice.

VII. *The Condemnation of the Sweater.*

The employer must never tax his workpeople beyond their strength, nor employ them in work unsuited to their sex or age. His great and principal obligation is to give to everyone that which is just. Doubtless before we can decide whether wages are adequate, many things have to be considered; but rich men and masters should remember this—that to exercise pressure for the sake of a gain upon the indigent and the destitute, and to make one's profit out of the need of another, is condemned by all laws, human and divine. To defraud anyone of wages that are his due is a crime which cries to the avenging anger of Heaven. "Behold the hire of the laborers . . . . which by fraud hath been kept back by you crieth, and the cry of them hath entered into the ears of the Lord of Sabaoth" Finally the rich must religiously refrain from cutting down the workmen's earnings, either by force, by fraud or by usurious dealing; and with the more reason because the poor man is weak and unprotected, and because his slender means should be sacred in proportion to their scantiness. (13-14).

VIII. *The Crime of Black-legging.*

Self-conservation is a law of nature, which it is wrong to disobey. Now if we were to consider labor merely so far as it is personal, doubtless it would be within the workman's right to accept any rate of wages whatever, for in the same way as he is free to work or not, so he is free to accept a small remuneration, or even none at all. But this is a mere abstract supposition; the labor of the working man is not only his personal attribute, but it is necessary, and this makes all the difference. The preservation of life is the bounden duty of each and all, and to fail therein is a crime. (28)

IX *The Duty of Trade-Unionism.*

The most important of all are workmen's associations. . . . We have spoken of them more than once, but it will be well to explain here how much they are needed, to show that they exist by their own right, and to enter into their organization and their work. The experience of his own weakness urges man to call in help from without. We read in the pages of Holy Writ: "It is better that two should be together than one; for they have the advantage of their society. If one fall he shall be supported by the other. Woe to him that is alone, for when he falleth he hath none to lift him up." And further: "A brother that is helped by his brother is like a strong city." It is this natural impulse which makes men band themselves together in associations of citizen with citizen. (31).

For to enter into "society" of this kind is the natural right of man, and the State must protect natural rights, not destroy them; and if it forbids its citizens to form associations it contradicts the very principle of its own existence, for both they and it exist in virtue of the same principle, viz: the natural propensity of man to live in society. (32).

X. *The General and Perpetual Law of Trades Unions.*

Speaking summarily, we may lay it down as a general and perpetual law that workmen's associations should be so organized and governed as to furnish the best and most suitable means for attaining what is aimed at, that is to say, for helping each individual member to better his condition to the utmost in body, mind and property. (35).

XI. *Organization and Purposes.*

The offices and charges of the society should be distributed for the good of the society itself, and in such manner that difference in degree or position should not interfere with unanimity and good will. Office-bearers should be appointed with prudence and discretion, and each one's charge should be carefully marked out—thus no member will suffer wrong. Let the common fund be administered with the strictest honesty, in such way that a member receive assistance in proportion to his necessities. If it should happen that either a master or a workman deemed himself injured, nothing would be more desirable than there should be a committee, composed of honest and capable men of the association itself, whose duty it should be, by the laws of the association, to decide the dispute. Among the purposes of a society should be to try to arrange for a continuous supply of work at all times and seasons; and to create a fund from which the members may be helped in their necessities, not only in cases of accident, but also in sickness, old age and misfortune. (36-37).

XII. *To the State: "Hands off Trade Unions"*

Let the State watch over these societies of citizens united together in the exercise of their right; but let it not thrust itself into their peculiar concerns and their organization; for things move and live by the soul within them and they may be killed by the grasp of a hand from without. (35).

XIII. *The Province of the State.*

The first duty of the rules of the State should be to make sure that the laws and institutions, the general character and administration of the commonwealth shall be such as to produce of themselves public well-being and private prosperity. . . . It is the province of the commonwealth to consult for the common good. And the more that is done for the working population, by the general laws of the country, the less need will there be to seek for particular means to relieve them. (21).

XIV. *The Obligations of the State to the Poor.*

When there is question of protecting the rights of individuals, the poor and helpless have a claim to special consideration The richer population have many ways of protecting themselves and stand less in need of help from the State; those who are badly off have no resource of their own to fall back upon, and must chiefly rely upon the assistance of the State. And it is for this reason that wage-earners, who are undoubtedly among the weak and necessitous, should be specially cared for and protected by the commonwealth. (24).

In all well-constituted States it is by no means an unimportant matter to provide those bodily and external commodities, the use of which is necessary to virtuous action. And in the provision of the material well-being the labor of the poor—the exercise of their skill and the employment of their strength in the culture of the land and in the work-

shops of trade—is most efficacious and altogether indispensable. Indeed their co-operation in this respect is so important that it may be truly said that it is only by the labor of the working man that States grow rich. Justice, therefore, demands that the interests of the poorer population be carefully watched over by the administration, so that they who contribute so largely to the advantage of the community may themselves share in the benefits they create—that being housed, clothed and enabled to support life, they may find their existence less hard and more endurable. (22 3).

XV. *The Duty of the State as to Strikes.*

When workpeople have recourse to a strike it is frequently because the hours of labor are too long or the work too bad, or because they consider their wages insufficient. The grave inconvenience of this not uncommon occurrence should be obviated by public remedial measures, for such paralysis of labor not only affects the masters and their workpeople but is extremely injurious to trade and to the general interests of the public; moreover, on such occasions violence and disorders are generally not far off, and thus it frequently happens that the public peace is threatened. The laws should be beforehand and prevent these troubles from arising; they should lend their influence and authority to the removal in good time of the causes which lead to conflicts between masters and those whom they employ. (25).

XVI. *Shorter Hours.*

It is neither justice nor humanity so to grind men down with excessive labor as to stupify their minds and wear out their bodies. Man's powers, like his general nature, are limited, and beyond these limits he cannot go. His strength is developed and increased by use and exercise, but only on condition of due intermission and proper rest. Daily labor, therefore, must be so regulated that it may not be protracted during longer hours than strength admits How many and how long the intervals of rest should be will depend on the nature of the work, on circumstances of time and place, and on the health and strength of the workman. Those who labor in mines and quarries, and in work within the bowels of the earth, should have shorter hours in proportion, as their labor is more severe and more trying to health. Then, again, the season of the year must be taken into account, for not unfrequently a kind of labor is easy at one time which at another is intolerable or very difficult. (27)

. . . . . As a general principle it may be laid down that a workman ought to have leisure and rest in proportion to the wear and tear of his strength; for the waste of strength must be repaired by the cessation of work. In all agreements between masters and workpeople there is always the condition, expressed or understood, that there be allowed proper rest for soul and body. To agree in any other sense would be against what is right and just. (27).

XVII. *Sunday Rest.*

If the owners of property must be made secure, the workman, too, has property and possessions in which he must be protected; and, first of all, there are his spiritual and mental interests. (25).

No man may outrage with impunity that human dignity which God Himself treats with reverence nor stand in the way of that higher life which is the preparation for the eternal life of Heaven. Nay, more—a man here has no power over himself. To consent to any treatment which is calculated to defeat the end and purpose of his being is beyond his right; he cannot give up his soul to servitude, for it is not man's own rights which are here in question but the rights of God, most sacred and inviolable. From this follows the obligation of the cessation of work and labor on Sundays and certain festivals. (26).

XVIII. *Child Labor.*

Work which is suitable for a strong man cannot reasonably be required from a woman or a child. And in regard to children, great care should be taken not to place them in workshops or factories until their bodies and minds are sufficiently mature. For

just as rough weather destroys the buds of spring so too early an experience of life's hard work blights the young promise of a child's powers, and makes any real education impossible. (27).

XIX *Women's Work.*

Women are not suited to certain trades, for a woman is by nature fitted for home work, and it is that which is best adapted at once to preserve her modesty and to promote the good bringing-up children and the well-being of the family.

XX. *When the Law Should Intervene.*

If by a strike or other combination of workmen there should be imminent danger of disturbance to the public peace; or if circumstances were such that among the laboring population the ties of family life were relaxed; if religion were found to suffer through the workmen not having time and opportunity to practice it; if in workshops and factories there were danger to morals through the mixing of the sexes, or from any occasion of evil; or if employers laid burdens upon the workmen which were unjust, or degraded them with conditions that were repugnant to their dignity as human beings; finally, if health were endangered by excessive labor, or by work unsuited to sex or age—in these cases there can be no question that within certain limits it would be right to call in the help and authority of the law. The limits must be determined by the nature of the occasion which calls for the law's interference—the principle being this, that the law must not undertake more or go further than is required for the remedy of the evil or the removal of the danger. (24).

XXI. *Boards of Conciliation and Arbitration.*

In these and similar questions, however, such as for example the hours of labor in different trades, the sanitary precautions to be observed in factories and workshops, etc.—in order to supersede undue interference on the part of the State, especially as circumstances, time and localities differ so widely—it is advisable that recourse be had to societies or boards, such as we shall mention presently, or to some other method of safeguarding the interests of wage-earners, the State to be asked for approval and protection. (29).

It is gratifying to know that there are actually in existence not a few societies of this nature consisting of either workmen alone, or of workmen and employers together; but it were greatly to be desired that they should multiply and become more effective. (31).

XXII. *Multiplication of Peasant Proprietors.*

If working people can be encouraged to look forward to obtaining a share in the land, the result will be that the gulf between vast wealth and deep poverty will be bridged over and the two orders will be brought nearer together. Another consequence will be the greater abundance of the fruits of the earth. Men always work harder and more readily when they lean to the soil which yields in response to the labors of their hands, not only food to eat but an abundance of good things for themselves and those that are dear to them. It is evident how such a spirit of willing labor would add to the produce of the earth and to the wealth of the community. And a third advantage would arise from this: Men would cling to the country in which they were born, for no one would exchange his country for a foreign land if his own afforded him the means of living a tolerable and happy life. (29).

XXIII. *Against Excessive Taxation.*

These three important benefits, however, can only be expected on the condition that a man's means be not drained and exhausted by excessive taxation. The right to possess private property is from nature, not from man; and the State has only the right to regulate its use in the interests of the public good, but by no means to abolish it altogether. The State is therefore unjust and cruel if in the name of taxation it deprives the private owner of more than is just. (32).

XXVI. *The Obligations of the Church.*

No practical solution of this question will ever be found without the assistance of religion and the church. It is we who are the chief guardians of religion and the chief dispenser of what belongs to the church, and we must not by silence neglect the duty which lies upon us. (11).

As far as regards the church, its assistance will never be wanting be the time or the occasion what it may; and it will intervene with the greater effect in proportion as its liberty of action is the more unfettered; let this be carefully noted by those whose office it is to provide for the public welfare. Every minister of holy religion must throw into the conflict all the energy of his mind and all the strength of his endurance. (39).

In concluding its article the *Review of Reviews* takes occasion to say that "as for the rest of the Encyclical it speaks for itself." Broadly speaking, it asserts that Cardinal Manning, Cardinal Gibbons and Archbishop Walsh have rightly interpreted the mind of the church as to the social obligations of its pastors, and such a declaration cannot fail to be productive of immense good far beyond the pale of the Roman Communion

POPE LEO. XIII., ENCYLICAL LETTER ON LABOR, 1893.

[Translated for the New York *World.*]

Constitutions and laws have their foundation in the character and traditions of nations and peoples, and they are the work of God through the centuries as the history of every country shows. But no law which wanders from religion or tends to subvert it can be otherwise than defective and in time must come to naught. Society is not a human invention but a divine inspiration, for the real social contract is not merely a right between man and man but between man and God. Where the individual fulfils his duty to God he cannot fail in performing his duty to society.

Property is an essential element to social order for the preservation and development of human life, and the divine law has declared property sacred and inviolable—"cursed is he who removeth his neighbor's landmark."

But the poor have, nevertheless, a right to be assisted by the rich; not by indiscriminate alms-giving but by preparing such employment for them as will be useful. "If a man will not work, neither shall he eat." But if he have no work, it is plainly the duty of those who can do so to provide it for him.

This legitimatises property. No so-called right has any sanction if not sanctioned by God, and no usurpation of others' rights can expect the blessing of Heaven.

Men talk of reason as their guide. But the theory of the sovereignty of reason is the source of all injustice, for each pretends to have reason for himself, and each arrogates to himself the right of making his own ideas triumphant as the most useful to his country. Each has a plan of action or reform.

Reform to be useful and to produce salutary and lasting effects must be opportuned and matured, and should be imposed by circumstances and should progress with due regard to time, which is the first minister of the Creator, for man is the unconscious instrument of God.

Men act with inextricable confusion of ideas, passions and interests. They impose unceasingly upon each other acts of which they can appreciate neither the course nor the result.

Each individual is free in the execution of an infinitisimal detail of an immense work, ignorant of the general plan His horizon is a cloudy atmosphere, hiding the skies beyond.

Rulers stand toward their people as magistrates of Heaven. How great, then, is their responsibility! How much it behooves them to seek the welfare of the toiling masses who appeal to them for justice!

The social question should be placed on a religious basis if we would obtain at once a philosophical and practical solution of the difficulty.

The divine decree is that man shall eat bread by the sweat of his brow, and the apostolic injunction declares that if a man will not work neither shall he eat.

Having then established these premises, it becomes an absolute necessity in human society that legislation in accordance with the commands of God and religion should follow and keep pace with the time for the protection of those who obey the universal order of the Creator and Preserver of all things.

Atheism and a departure from the Christian faith are the great aids and stimulants of anarchy and socialism. The Christian faith alone is the bulwark of social order. Where Christian institutions and customs are not maintained in a State there must be disorder, bewilderment and decay.

At this moment Europe is in the throes of an immense upheaval of society, in which one violent struggle succeeds another unceasingly. In many cases the reason is to be found in the fact that legislation has not been duly enacted, for every person should have his legitimate part in the benefits of society according to the order of Providence.

This state of unrest is not confined to the working classes, properly so called. It has taken root and is bearing nefarious fruit in the more cultivated part of society.

The masses who do not perceive the niceties of light and shade, seeing those moving in a superior condition of life adherents of the principles of socialism, allow themselves to be blindly led by agitators who have no real interest in the cause they so loudly uphold beyond a sordid or a selfish one.

And this is why strikes are so unproductive of beneficial results. Placed on a basis more social than economic; being more of a struggle than a pacification more of aggression than defence, the strike loses its natural aspect and hides its essence.

A strike can be justified only as a means of defence when an individual's interests is attacked. Never can it be justified as a collective arm of aggression.

Man has a natural right to live and to work. As a means of procuring a living he has a right to remove every obstacle to his work and to get the value of his labor. And, therefore, when his labor is neither productive nor remunerative he has a right to refuse to continue it.

But an individual right cannot be transferred into a collective right, nor can an arm of defence be changed into an arm of aggression to cause a means of good to degenerate into a source of harm. An aggressive strike is not reciprocal between operative and operative but an instrument of attack upon the proprietor and property.

The operative on strike is a passive and dominated instrument, not an intelligent and free being. While his action lessens the capital of the employer it puts no money into his own pocket.

The struggle of illegal coercion is one of the glories of the Catholic Church, and this, as well as the welfare of the people, should always be uppermost in the minds of every government.

If the discontented operative is to be detached from anarchic socialism, his wants must be understood by his rulers, who must not leave to unscrupulous agitators the monopoly of social reform.

Nor should it be forgotten that many who range themselves under the banner of socialism repudiate everything illegal in the programme of anarchy, excepting only those things which regard the resolving of the urgent difficulties of economical and political reform demanded by the exigencies of society. The chaff must be separated from the wheat and just demands must be satisfied if a still more terrible upheaval is to be avoided.

Nor should the danger be considered improbable when we see what rapid strides anarchic socialism is making. The demonstrations which have taken place and the tumults and riots which have followed are most grave symptoms of the situation and call for the serious attention of the most astute economists and law-makers who must acknowledge that democratic socialism has ripened into a power of which it is necessary to take count, and in the face of which it is incumbent to adopt wise and prudent tactics in order to bring about spontaneously those economic reforms which are favored by equity, justice, mercy and religion.

Nor can anyone fail to recognize what grave errors have been committed by those governments which are hostile to the church, and which would deprive her of her power-

ful prestige—the great buckler and shield of ruler and people. The potency of religion and charity opposes an insurmountable obstacle to the dangerous movement which human force and human repression can only make more grave.

The right of protecting the operative, whether in the factory or in the field, should be admitted And for this purpose the maximum of labor as well as the minimum of salary should be fixed. The hours of labor should be arranged, giving due attention to days of rest and abstention from labor.

Institutions should be founded and maintained for the sick, the old the feeble and for those who are unavoidably unoccupied, while punishment should be meted out to the drones of society.

Laws have been made almost universally for the protection of women and children laboring in factories and elsewhere, but in how many cases have those laws been enforced? Inspectors of work should be appointed everywhere whose duties should be to see that these laws are not infringed.

Thus the blessing of Heaven would rest upon nations and a more calm and equitable state of things might be expected.

LABOR LEGISLATION IN ENGLAND.

By R. S. Vicktorov, in the Engineering Magazine, Aug., 1893.

"Labor Legislation" is notoriously a perpetual topic of all contemporary law-making bodies. Everywhere labor loudly demands "protection" against the encroachments of the employers; and politicians, making a virtue of necessity, grant more and more of the demands. A bold minority of the workmen go to the length of agitating for the total suppression of private competitive enterprise and the assumption of all industrial functions by the State. Few practical and active men of affairs sympathize with this utterly impracticable revolutionary plan, but there is as yet scarcely any recognition of the fact that the same vicious principle underlies most of the less radical proposals advanced in the interests of "labor," and hence even among business men of experience the opposition to paternal legislation is but feeble. In truth, labor's implicit trust in legislation is no anomaly. Most of us are addicted to the habit of appealing to government for aid and salvation. The feeling is widespread that "the law" can and should eliminate all existing evils and rectify all surviving wrongs It is to politicians that manufacturers look for profits, farmers for low interest and high prices, and workmen for high wages and short hours. This universal faith in the efficacy of legislation persists in spite of overwhelming adverse evidence. The absolute failure of one law does not prevent us from clamoring for another of the same kind; the mischief following one legislative excursion into the business sphere does not serve as a warning against inviting another.

Look at recent federal legislation in the "people's interest" in the United States. The present financial crisis is generally attributed to the Sherman Silver law—a law that was passed to secure the benefits of an abundant currency. Will the pernicious consequences of this act teach the lesson of less government tampering with currency and more financial freedom? Hardly. Or take the tariff. Whether we are theoretically protectionists or free-trades, the absurdity of a large class of business men anxiously watching every move of a lot of politicians in Congress must be manifest to all. Frequent changes breed confusion, uncertainty, distrust, while business requires stability and confidence above all things As long, however, as the tariff remains "in politics" no permanent condition is possible. The Interstate Commerce law is another abortive effort to check certain objectionable practices that competition alone is competent to deal with. The "protective" features of the law are successfully evaded, while new evils are called into being by it that are offset by no advantage whatever. And where are the great results of that other popular measure, the anti-trust law? The few attempts at its enforcement have only furnished amusement and political capital.

The important consideration is that every restriction tends to cripple industry and hurt both employers and employed. Blind interference with the laws of industrial development attempts to accomplish results which in the nature of things cannot be arbitrarily and summarily accomplished, retard the increase of wealth and the spontaneous adjustment of the relations between the co-operating forces in production. Industry needs freedom, opportunity. Business men need to learn the lesson that industrial freedom is the first condition of prosperity and stability, and that politics is fatal to business.

The whole history of English labor legislation—the parent of all paternal and socialist proposals—enforces the truth that the true interests of labor cannot be promoted by political measures. The record is one of failures, abortions, farcical results and disappointments. No proper history of the rise and growth of the factory system and the concomitant legislation has yet been written, but the facts afforded by the historians of this system are instructive enough to be reviewed here.

The first English factory (in the modern sense) was the celebrated silk "throwing mill" erected in Derbyshire in 1719 by Sir Thomas Lombe. It is certain, however, that factories of a primitive kind were in existence before that date. In 1340 one of the chief promoters of of cloth-making in Bristol was ordered by a local court to pay a fine "for having caused various machines for weaving and making woollen cloths to be set up in his houses, and for having hired weavers and other workmen for this purpose." Lombe's patent for the machinery expired in 1732, and the "industrial revolution" was started upon its way. In 1832 the change in industrial method had spread so wonderfully that we find parliament and the country debating the first comprehensive scheme of legislation devised to modify some of the results of the new system.

There was violent opposition to the early factories on the part of the working people, and the popular literature of the day gives expression to the feelings of the dissatisfied operators. "When the first factories were erected," says Alfred, the historian of the factory movement from 1802 to 1847, "it was soon discovered that there was in the minds of the parents a strong repugnance to the employment thus provided for their children, and for a long period it was by the working people themselves considered to be disgraceful for any father who allowed his child to enter the factory." As early as 1779 a spinning mill of Arkwright's was wrecked. Somewhat later Peel's printing works were gutted and the machinery destroyed. When the first steam engine for spinning was erected by Mr. Hall he was obliged to convert his mill into a garrison and keep the gates locked both by day and night. These are samples of what occurred in Lancashire and similar scenes were enacted in Yorkshire, and in the Midland counties. Factories were destroyed, manufacturers attacked and one manufacturer was shot near his own home. As late as 1835 opposition was encountered when steam was first applied to ribbon-weaving. The interesting fact may be recorded, that in the case just mentioned the very remarkable experiment was tried, in the hope of conciliating the workmen and combining the advantages of the factory with those of domestic industry, of having a central engine to supply power to a number of cottages grouped round. The experiment naturally failed.

Froude quotes the curious statute passed in the reign of Philip and Mary which was directed against factories. The statute is called "An Act Touching Weavers," and runs thus: "Forasmuch as the weavers of this realm . . . complained that the rich and wealthy clothiers do in many ways oppress them, some by setting up and keeping in their houses divers looms, and keeping and maintaining them by journeymen and persons unskilful, to to the decay of a great number of artificers which were brought up in the said service of weaving, with their families and their households, some by engrossing of looms into their hands and possession and letting them out at such unreasonable rents as the poor are not able to maintain themselves; . . . some also by giving much less wages and hire for weaving and workmanship than in times past they did, whereby they are enforced utterly to forsake their art and occupation, . . . it is therefore, for remedy of the premises and for the avoiding of a great number of inconveniences which may grow if in time it be not foreseen, ordained and enacted by authority of this present Parliament that no person using the feat or mystery of cloth-making and dwelling out of a city, borough, market-town or incorporate town, shall keep or retain, or have in hisor their

houses or possession any more than one woollen loom at a time, nor shall by any means, directly or indirectly, receive or take any manner of profit, gain or commodity, by letting or setting any loom or any house wherein any loom is or shall be used or occupied, which shall be together by him set or let," etc. A provision follows limiting weavers living in towns to two looms. The intention of course was to prevent the cloth manufacture from falling into the hands of large capitalists, and to enable workmen to earn their living in their own separate homes.

It is instructive to recall the pathetic preference for "home work" and bitter opposition to the factory in these days of popular and philanthropic clamor *against* home work. Labor reformers who are so anxious to force all workers into the factories are probably unaware of the attitude of the early factory workers and their champions towards the new arrangements that faced them.

Whether the anti factories statute was formally repealed or simply disregarded and consigned to oblivion, is not stated by the historians. It was never vigorously enforced, though there is no doubt that the legislation which was directed against labor was faithfully carried out. It was not till 1795 that a workman could legally travel in search of employment out of his own parish, it was not until 1812 that the power of the magistrates compulsorily to fix the laborer's wages was withdrawn, and the famous statute of apprentices was not repealed until 1814.

In 1796 the first protest against "unregulated factories" was raised by a committee called the "Manchester Board of Health," which enumerated the evils of the factory system, and proposed an application for parliamentary aid to establish a system of laws for the government of cotton factories. By that time the repugnance of the operatives to factory labor had been largely overcome, and some had actually begun to live on the wages of their children. The first Bill dealing with the subject of child labor was that prepared by Robert Owen, and presented to members of Parliament in 1816. It forbade the employment in factories of children under ten years of age, and limiting their hours of work up to eighteen years to 10½ hours a day. It further prohibited them from night-work, and provided for half-an-hour's instruction daily at the expense of the employer; it was to apply to all "cotton, woollen, flax and other mills, manufactories, and buildings in which twenty or more persons shall be employed under the age of eighteen years." Sir Robert Peel at first pretended to favor the measure, but subsequently he declined to father it, and introduced instead a Bill to apply exclusively to cotton mills, which was far less stringent in its provisions. This, however, was not the first factory Bill brought before Parliament. Sir Robert Peel had already passed one important measure through that body—the Factory, Health and Morals Act of 1802. This first English factory Act applied principally to *apprentices* in cotton mills, and in no way affected *free labor*. Its principal provisions point to a time when the employers stood in a sort of paternal relation to their apprentices, and indicate that the new industrial system had not yet emerged from that phase when mills were built in unfrequented places and supplied with apprenticed workers from a distance. The apprentices' hours of work were not to exceed twelve a day, and they were to be instructed every day during the first four years in reading, writing and arithmetic, the time to be counted out of their work hours. They were likewise to be instructed in the principles of the Christian religion, and made to comply with the various religious ordinances. Other provisions relate to their food, apparel and health.

This law, by placing the apprentice law at a disadvantage, constrained the manufacturers to abandon it. They now preferred *free* labor. This effect of the law, coupled with the adoption of a new motor, which by removing the necessity of building factories in remote and water-abounding districts, and permitting their establishment in populous places, rendered the apprenticeship system unnecessary, was in turn the cause of the next move of the factory reformers. In 1815 Peel proposed a new measure applying to all children alike. What he proposed was that no child should be employed under the age of ten years and that the duration of children's labor should be limited to twelve hours and a half per diem, including the time for education and meals, which would leave ten hours for work proper. In presenting this Bill, Peel regretfully acknowledged that the inspectors appointed under his previous Bill had been very remiss in the performance of their

duties. But this Bill met with vigorous opposition, and its author was induced to alter the form of his motion into a proposal for a committee of inquiry to ascertain the conditions of child labor and report to Parliament. This proposal was accepted and a parliamentary inquiry—the first of its kind in English history—was authorized. The committee commenced its sittings in 1816. Its proceedings and conclusions were alike contemptible. It was in fact a complete fiasco. The value of the testimony taken by it may be judged from the fact that, whereas the average death rate in England at that time was 1 in 50, it appeared from the "evidence" that in the cotton factories it was 1 in 445! The reformers generally exaggerated the evils of the state, while their opponents indulged in preposterous eulogies of factory labor. On the one hand medical men and other witnesses spoke of the absolute impossibility of supporting healthy life under the circumstances that existed in the factories, while on the other tabulated statements and documents signed by clergymen and magistrates were presented showing the superiority of the health and *morals* of children employed in factories over those of children employed in other trades. One witness, a surgeon, was not sure that the inhaling of dust and cotton fibre was injurious to health, suggesting that the bad effects in this case might be counteracted by "constant expectoration."

The upshot of this "investigation" was a new law, passed in 1819, applying exclusively to cotton mills. It forbade the employment of children up to nine years of age, limited the hours of work for all persons under sixteen years of age to twelve per day, less 1½ for meals, and made some provisions for recovering time lost by defect of water. The law, however, contained no adequate provisions for inspection and attendance of witnesses in cases of prosecution, and hence was easily set at naught. Several amendments of the law followed, the last being that passed in 1831, which prohibited night-work in the case of persons under twenty-one years of age in cotton factories.

Discouraging as these results were to the promoters of factory legislation in Parliament, the operatives and the reformers outside of Parliament found in them a stimulus to further agitation. Demands were boldly made for a work-day of ten and even eight hours for children. But the Government had now determined to take the initiative themselves and stave off radical legislation by moderate proposals. A motion was made on behalf of the Government for the appointment of a Royal Commission to visit the factory districts and collect information. It was adopted and the commission was appointed. The operatives and their friends resented the presence of the commissioners in their districts and protested against the proceedings. They asserted that full evidence on all important points had already been collected and that the real object of the Government was to procure evidence unfavorable to further legislation. The commission, however, reported in favor of further legislation on behalf of the factory children, and in 1833 the Government offered and passed the important Bill commonly spoken of as Lord Althorp's Act, which has formed the basis of all subsequent legislation. The Act prohibited the employment of children under nine years of age in all mills and factories except those for the manufacture of silk. It was made unlawful to employ children in any mill for a longer than forty-eight hours in one week, or nine hours in one day. Two whole and eight half holidays in the year were provided for, as well as daily attendance at school for at least two hours. Surgical certificates of age were required, and factory inspectors were given large powers. No person under eighteen was to be employed at night. Compulsory education was for the first time formally recognized as a function of government.

But scarcely was Lord Althorp's Act in operation when numerous and grievous imperfections in it were indignantly pointed out by the factory reformers. Several of the clauses were so drawn as to be absolutely incomprehensible, and the important item of administration was a total failure. The provisions respecting meal times were insufficient, and a wide margin was allowed in the selection of the working hours of the protected employees. A regular system, known as the Relay System, was at once devised for defeating the intention of the Act. To keep their machines going longer than twelve hours, the manufacturers established relays, which commenced work at different times of the day; and the factory inspectors declared that so long as the employers had the power to work relays, to fix irregular meal hours, and to alter continually at pleasure the working time of every individual, no legal restriction of the time of labor could be enforced.

The regulations respecting certificates of age did not work well. The expedients for gauging the ages of children applying for work were all unreliable, and parents obtained certificates for immature children by substituting older ones for them. When inspectors visited the works, the doubtful cases were hidden under large baskets or otherwise concealed, or their shoes and clothing were stuffed to make them appear stouter and taller. There were other defects in the law. The time within which an information for an infringement of the law might be laid was only fourteen days. Manufacturers were not prohibited from sitting in judgment on factory cases. The over-working of any number of children simultaneously by an employer was construed as one offence and punished accordingly. Hence it was more profitable to break the law than to obey it.

Under these circumstances the agitation was renewed, and several unsuccessful attempts were made to amend the Bill which had proved so ineffective. In 1840 a resolution was passed providing for a children's employment commission. In 1843 the commission made its report, urgently favoring legislation with reference to certain trades and manufactures. The only result, however, was an Act applying to print works which pleased nobody.

A new factory Bill was passed in 1844. This Bill embraced precautions against the devices which had defeated the previous measure, and contained some novel and striking features. It was now proposed to extend the protection of the law to adult women; and machinery and mill gearing were to be fenced. The hours of work for children were reduced to six and a half per day, to be taken either in the morning or afternoon. In 1847 the Ten Hours' Act was passed, which limited the hours of labor for women and young persons to ten hours a day and fifty-eight a week. But the relay system was again introduced, and it was impossible for the inspectors to enforce the law, especially since the courts had declared the relay system legal. To surmount these difficulties a compromise Bill was passed which established a different limit to the working day, namely, from six a.m. to six p.m. in summer, and from seven a.m. to seven p.m. in winter, with one and a half hours for meals, and till 2 p.m. on Saturday. This statute brought the ten hours' dispute to a close, and remained in force for fourteen years. In 1860 bills were passed regulating bleaching and dyeing industries, and soon afterward legislation was applied to lace works and bakeries.

In 1862 a second children's employment commission came into existence which "nearly exhausted its subject," and issued numerous reports. The first important result of its labors was the new Factory Act of 1864, in which the previous legal conception of a factory as a place where only textile fabrics are produced and mechanical power employed, was formally abandoned. The new Act applied to four kinds of manufacture not textile, and to two kinds of "employment." The agreement was that in those particular industries and employments—the manufacture of earthenware, lucifer matches, cartridges, etc., and the employments of paper staining and fustian cutting—hardships prevailed, and therefore required to be regulated and looked after. Naturally this argument justified interference with numerous other occupations, and in 1867 the Factory Acts Extension Bill was passed, whose provisions applied not merely to factories in the old sense, but to any premises in which fifty or more persons were employed in any manual labor incidental to the making of any article. The transformation was almost complete, and it only remained to add places where less than fifty persons were at work to cover every material industry.

And this was actually undertaken within the same year by the Workshop Regulation Act. A workshop was defined to mean any place or room in which any handicraft is carried on by any young person, woman or child under the direction of another. The Act differed little from the Factory Acts. At first the local authorities were charged with the supervision of the workshops, but their failure to perform the new duties subsequently led to the handing over of the Act to the factory inspectors for enforcement.

In 1874 an Act was passed which amended the factory laws in certain particulars. Labor in textile factories was reduced by half an hour per day, the minimum age for children was raised to ten, and it was made illegal to employ a young person under fourteen who had not passed a certain educational test.

Of course these Acts did not close the factory controversy. No sooner had they become law than new agitation sprang up on several new subjects. Shop-labor, wandering

occupations, even domestic labor, began to clamor for protection. At the same time the laws relating to factories and workshops, and the practices and judicial decisions in regard to the relation between them, had reached an intolerable pitch of confusion. To consider the new claims and reduce the conflicting and contradictory statutes to order, a Royal Commission was appointed in 1875. The commission was to consider the consolidation and amendment of existing laws, and decide whether any of their provisions might be properly extended to other trades and occupations. But the commission disappointed the factory reformers by dealing almost exclusively with the first half of its task. They brought together existing laws into one statute, but recommended no new legislation of consequence. They excited indignation by announcing their purpose to be the relief of minor industries from the pressure of legislation and the securing of more independence to adult labor. The Factory and Workshop Consolidation Act of 1878, which was the outcome of the commission's labors, is the one still in force. It deals with five classes of work—textile factories, non-textile factories, workshops, workshops in which only adults are employed, and domestic workshops. Certain industries—straw plaiting, pillow-lace making and glove-making—are left free, and the exemption extends to any handicraft exercised in a dwelling house by a family at irregular intervals. Workshops where men only are employed are, unlike factories, always exempted. A factory, under this Act, is a place in which machinery is moved by some mechanical power. The works where manual power is made use of exclusively are workshops.

The demand for legislation at present is precisely in those directions which the current law leaves free. The cry is now for regulation of adult labor and for interference with minor industries. Laws are demanded against "sweating," home work being regarded as the citadel of the evils summarized under that term. It is held to be imperatively needful to force all workers into the factories. Strenuous efforts are made to bring all home industries under inspection. Thus Mr. Charles Booth has been giving evidence before the English Labor Commission, and he has been suggesting ways of getting rid of the "sweating evil." A good deal might be done, he thought, by a "sufficiently wide extension of the Factory and Workshops Act." He favored a provision that home workshops should be registered and made subject to inspection and supervision. He would define a workshop as any room or place where any person joined another person in manufacturing, and *that would include a man and his wife*, while two men working in partnership would be considered as employing one another. The industries that would be most effected by this legislation would be tailoring, boot-making, cabinet-making, and upholstery, with seamstresses' work of all kinds. The larger number of persons employed in home workshops are women, but Mr. Booth thought it would be a desirable thing to see home work superceded by work in factories to a very considerable extent, though not to the extent of driving it out altogether. There were thousands of cases, according to Mr. Booth, in which registration and inspection would at once begin to apply, where the rooms in which two or three persons worked were used also as living rooms and sleeping apartments.

A word may now be said on the subject of the effects of factory legislation. All the English economists were opposed to the sweeping Act of 1844, and warned Parliament that its passage would surely cause diminution of production, rise in cost of production, fall in rate of wages and profits, rise in prices, and loss of foreign trade. It is true that hardly any economists of to-day would wish to see that Act repealed. The results they feared and expected nowhere came to pass. Instead of dwindling, the English textile industries developed enormously during the years 1850-63, and English industry flourished during the twenty years immediately succeeding the introduction of the Factory Acts. But no economist claims that this prosperity is *due* to the factory legislation. On the other hand, there are economists who trace certain evils to the operation of the factory laws. The sweating system has for a chief cause this labor legislation. As one writer says: "On the whole, factory legislation tends to press heavily on the very weakest class of workers. Their last asylum is some hitherto unregulated branch of domestic industry. Such a refuge, for instance, has been the wearing apparel trade." Factory legislation has also injured the weaker elements of the capitalist class, and everything that hurts the small business man hurts the workman. During the decade 1853-63 no less than three

hundred cottage factories were shut up. The struggle between the cottage factories and the factory system proper naturally ended in the complete ruin of the smaller works. This concentration of industry was unquestionably accelerated by factory legislation.

The probability is that the improvements in the condition of the operatives would have gradually taken place even if Parliament had not interfered at all. It is easy to mistake coincident circumstances for cause and effect, and those who claim that factory legislation has been an unmixed blessing fall into this error.

MEMORANDUM.

The Labor Gazette is issued monthly by the Labor Department of the Board of Trade of Great Britain. The July, 1893, number of this official publication contains the following:

Explanation of the Regulations affecting Hours of Labor, Meal Hours and Overtime in Factories and Workshops.

"The following memorandum has been prepared for the Gazette by one of the labor correspondents of the Board of Trade, assisted and advised bythe Chief Inspector of Factories:

"One of the rules strictly observed in the Factory Department of the Home Office is that every complaint made to a factory inspector shall be investigated. The incredulity with which this statement is frequently received has its origin (in so far as it springs from experience) in most cases in ignorance of the provisions of the Acts. H. M. Chief Inspector of Factories states that a very considerable proportion of the communications received deal with conditions of employment which are either permitted by the Acts or do not come within their scope. Many of the letters informing the inspectors of these alleged violations of the Acts are anonymous, and it is therefore impossible to answer the writers, who are of necessity left to suppose that their complaints have been neglected With a view to diminishing this cause of mutual vexation, a few points have been selected on which error is most frequent, and the following brief explanations of the Acts respecting them are given:

Textile Factories. The hours of work permitted in textile factories are shorter than those allowed in non-textile factories. Women and young persons in *textile* factories may work from 6 a.m. to 6 p.m., or from 7 a.m to 7 p.m. on ordinary days, with at least two hours' interval for meals, of which one hour must be given before 3 p.m. On Saturdays the hours may be from 6 a.m. to 1.30 p m. if one hour be allowed for a meal, and from 6 a.m. to 1 p m. if only half an hour be allowed; or if work begins at 7 a.m. it may be continued until 2 o'clock, with at least half an hour for a meal. No young person or woman may be employed continuously for more than 4½ hours without an interval of at least half an hour.

In textile factories, therefore, young persons and women may not work more than 10 hours a day on ordinary days, and six and a half hours on Saturdays, exclusive of meal times. In textile factories overtime is not permitted.

Non-Textile Factories. In *non-textile* factories the hours of work may be from 6 a.m. to 6 p.m., 7 a.m. to 7 p.m., 8 a.m. to 8 p.m. (in a great number of cases), and in a few exceptional cases from 9 a.m. to 9 p.m. with only 1½ hours for meals. On Saturdays the hours may be from 6 a.m. to 2 p.m. with half an hour for a meal, from 7 p.m. to 3 p.m., or from 8 a.m. to 4 p.m. with one hour for a meal. Here, also, of the time allowed for meals, at least one hour must be given before 3 p.m. No young person or woman may be employed continuously for more than five hours without an interval of at least half an hour.

In non-textile factories, therefore, young persons and women may work ten and a half hours a day on ordinary days and seven and a half hours on Saturdays, exclusive of meal times. In non-textile factories overtime is permitted in certain classes of factories.

Workshops. Young persons in workshops are subject to the same regulations as young persons and women in non-textile factori s. Women employed in workshops in which children or young persons are employed are subject to the same regulations as young persons. But a workshop where only women are employed (notice of such an arrangement being necessary) they may be employed for a specified period of 10 hours between 6 a.m. and 10 p.m. on ordinary days with 1½ hours for meals, and of 8 hours on Saturday between 6 a.m. and 4 p.m. with half hour for a meal.

In workshops, therefore, where no persons under 18 are employed, if due notice has been given, women over 18 years of age may be employed from 9 a.m. to 9 p.m., or from 10 a.m. to 10 p.m. on ordinary days. But if the occupier of the workshop after such notice intends to employ children or young persons, he must give notice of his intention to the Inspector, and he may not change his system oftener than once a quarter.

The Workshops Act, 1867, contained a clause exempting workshops where not more than five persons were employed from a certain regulation. This clause was afterwards repealed, but it seems to have given rise to a widespread belief that workshops where fewer than five persons are employed are not subject to regulation. Any workshop in which a woman or young person not a member of the family of the employer, is employed, is subject to the regulations given above.

Domestic Workshops. Even in domestic workshops, in which only members of the family are employed the hours of young persons are subject to regulation. Such young persons may be employed from 6 a.m. to 9 p.m. on ordinary days, with intervals of at least 4½ hours for meals and absence, and from 6 a.m. to 4 p.m. on Saturdays with at least 2½ hours for meals and absence. Overtime is not permitted.

Therefore parents employing young persons, members of their family, in domestic workshops after 9 p.m., are liable to a penalty.

When Overtime is Permitted Overtime is permitted for 48 days in the year in some factories and workshops (1) where the material worked upon is liable to be spoiled by weather; (2) where press of work arises at certain recurring seasons of the year; (3) where the business is liable to sudden press of orders arising from unforeseen events.

In factories and workshops, therefore, in which articles of wearing apparel are being made, as well as in a large number of others, young persons and women may be employed from 8 a.m. to 10 p.m. with 2 hours interval for meals, for 48 days in the year, provided due notice is given to the factory inspector.

CANADA.

An Act to provide for the Collection and Publication of Labor Statistics.

[Assented to 16th May, 1890.]

Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

1. There shall be a branch of the Department of Agriculture known as the "Bureau of Labor Statistics," and the Minister of Agriculture for the time being shall be the Commissioner of Labor Statistics.

2. The Governor-in-Council may, from time to time, appoint an officer who shall be called the "Assistant Commissioner of Labor Statistics," shall hold office during pleasure, and shall receive a salary to be determined by the Governor-in-Conncil.

3. The duties of the commissioner shall be to collect, classify and arrange, and present in quarterly bulletins and in yearly reports to Parliament, statistics relating to all kinds of labor in Canada, and such statistics may be classified in the manner set forth in the schedule to this Act.

4. It shall be the duty of the commissioner to collect from Dominion, Provincial and municipal officers, and from all officers of any public institutions in the nature of boards of trade, harbor commissioners, and of all trades unions, mutual benefit associations, master builders' associations and other workingmen's associations, all the information in their power necessary to assist in carrying out the objects of this Act; and he may for that purpose examine witnesses upon oath; and the evidence so taken shall be filed and preserved in the office of the commissioner.

5. The sum of ten thousand dollars per annum is hereby appropriated out of the Consolidated Revenue Fund for the expenses of the bureau, including the cost of printing the annual report of the commissioner, but not including the salary of the assistant commissioner.

This Act shall be construed as enacted in addition to and not in derogation of chapter fifty-nine of the Revised Statutes, intituled "An Act respecting Statistics."

SCHEDULE.

Classification of Statistics.

(*a*) Agriculture.

(*b*) Mining.

(*c*) Mechanical and manufacturing industries.

(*d*) Transportation.

(*e*) Clerical and all other skilled and unskilled labor.

(*f*) The amount of cash capital invested in lands, buildings, and machinery, respectively ; and the means of production and distribution generally.

(*g*) The number, age, sex and condition of persons employed, the nature of their employment ; the extent to which the apprenticeship system prevails in the various industries requiring skilled labor ; the number of hours of labor per day ; the average time of employment per annum, and the net wages received in each of the industries and employments in Canada.

(*h*) The number and condition of the unemployed, and their age, sex and nationality, together with the cause of their idleness.

(*i*) The sanitary condition of lands, workshops and dwellings ; the number and size of rooms occupied by workers, etc., the cost of fuel, rent, food, clothing and water in each locality in Canada ; also the extent to which labor-saving processes are employed, the extent to which they displace hand labor, and their effect upon the wages of adult laborers.

(*j*) The number and condition of the Chinese in Canada ; their social and sanitary habits ; the number of married and of single ; the number employed and the nature of their employment ; the average wages per day in each employment, and the gross amount yearly ; the amount expended by them in rent, food and clothing, and in what proportion such amounts are expended for foreign and home productions respectively ; to what extent their labor comes into competition with the other industrial classes of Canada.

(*k*) The number and condition of, and the nature of the employment of the inmates of prisons, county jails and reformatory institutions in Canada, and to what extent their employment comes into competition with the labor of mechanics, artizans and laborers outside of these institutions.

(*l*) A description of the different kinds of labor organizations in existence in Canada, and what they accomplish in favor of the classes for whose benefit they are organized.

(*m*) All such other information as the commissioner deems essential to further the objects of this Act.

UNIVERSITY OF TORONTO.

REPORT OF

STANDING COMMITTEE

ON FINANCE

1892-3.

ADOPTED DECEMBER 9TH, 1892.

TORONTO:
PRINTED BY WARWICK & SONS, 68 AND 70 FRONT STREET WEST.
1893

UNIVERSITY OF TORONTO.

REPORT OF STANDING COMMITTEE ON FINANCE

TORONTO, November 15th, 1892.

The Standing Finance Committee beg to submit their report for the year ending 30th June, 1893.

1. They have obtained from the Bursar the estimates of the receipts on income account for the year; and from the Bursar and the heads of University departments they have received estimates of the probable expenditures for the year.

2. They also incorporate in their report, for the sake of convenience, the estimates of University College, which have been furnished to the Committee for their information by the Council of University College.

3. The forms of account which were employed in last year's report have been adhered to, and for the purposes of comparison the actual results of the transactions of the year 1891-92 are given.

RECEIPTS.

I. ORDINARY REVENUE.

	Estimate 1892-3.	Receipt, 1891-2.
	$ c.	$ c.
(*a*) Interest on balance purchase moneys (old sales)	938 56	716 12
Interest on balance purchase moneys (new sales, Devonshire Place survey)	1,062 40	1,147 40
(*b*) Interest on loans	37,880 33	36,148 97
Interest on debentures	20,052 87	17,201 86
(*c*) Interest on bank balances		5,826 56
(*d*) Rents (other than Park)	3,493 00	2,748 19
Rents (University Park)	8,300 00	7,666 23
Allowance for occupation by Medical Faculty of part of Biological building:		
Rent $1,200 00		1,200 00
Share of maintenance 700 00	1,900 00	
Rent Upper Canada College block		59 15
Carried forward	73,627 16	72,714 48

ORDINARY REVENUE.—*Continued.*

	Estimate 1892-3.	Receipt, 1891-2.
	$ c.	$ c.
Brought forward	73,627 16	72,714 48
(*e*) Fees—University and College	35,575 00	23,485 25
(*f*) City of Toronto, payment	6,000 00	6,000 00
(*g*) Transfer fees	50 00	60 00
(*h*) Dividend on bank stock	24 50	24 50
(*i*) Interest on advance $57,956.15 to Upper Canada College	2,679 58	
(*k*) Casual accounts:		
Insurances *re* mortgages		19 64
Pasturage		11 00
Scholarships (amount of cheques issued in 1889 not called for by parties entitled to them, cancelled		160 00
Prizes University College (properly belonging to previous year but not received till this year)		15 00
	117,956 24	102,489 87
Less portion of fees to go to Medical Faculty	400 00	480 00
Less amount written to contingent fund		5,000 00
Total ordinary revenue	117,556 24	97,009 87

II. ABNORMAL RECEIPTS.

	1892-3.	1891-2.
	$ c.	$ c.
(*a*) Unexpended balance of abnormal receipts of last year	6,999 16	19,286 76
(*b*) Unexpended balance of ordinary revenue of last year	2,475 15	
Total abnormal receipts	9,474 31	19,286 76

SUMMARY.

	$ c.
Ordinary revenue for year	117,556 24
Abnormal receipts for year	9,474 31
Total receipts for year	127,030 55

DEDUCTIONS.

From this total of $127,030.55 the following deductions must be made :

	Amount of balance at 30th June, 1892.	Amount of interest.
(1) Interest on the following special funds included in statement No. I, Ordinary Revenue.	$ c.	$ c.
(*a*) Library Building Fund	27,527 09	200 00
(*b*) Library Insurance Fund (books)	47,062 04	1,882 40
(*c*) Museum Restoration Fund	5,761 09	150 00
(*d*) Residence Extension Fund	707 82	28 31
(*e*) Medical Faculty Surplus Fund	8,152 01	407 60
(*f*) Students' Fund (gymnasium)	2,217 97	88 72
(*g*) University Club and Gymnasium	1,664 80	66 59
(*h*) Vice-Chancellor's Special Account	361 85	14 47
(*i*) Retirement Fund	2,628 53	157 70
(*k*) Specific Endowment (Scholarships)	39,113 61	2,346 81
	$135,196 81	$5,342 60
(2) Cost of 12-inch water main through Queen's Park for fire protection purposes		2,100 00
(3) Interest on cost of Gymnasium ($20,000)		800 00
(4) Interest on portion of cost of Chemical Building (assuming that about $20,000 will be expended during the latter part of current financial year)		400 00
Total of deductions		$8,642 60

Leaving $118,387.95 available for the service of the year.

GENERAL REMARKS ON THE PRECEDING STATEMENTS.

I. (*d*) Rents.

4. The estimated receipts are increased by $700, being the amount payable by the Medical Faculty as their share of the cost of maintenance of the Biological Building for last year. This amount is arrived at by charging the Medical Faculty with one-third the actual expenditure on Maintenance Account ($1,407.65 : $\frac{1}{3}$ = $469.21) : one-third the salary of caretaker ($480 : $\frac{1}{3}$ = $160), and a charge for lighting the dissecting-room, roughly estimated at about $70.

5. A small sum was realized last year, as appears by the accounts, for rent of a portion of the Upper Canada College block to a lacrosse club. This was but a transient arrangement, however, and it appearing very doubtful if any amount will be realized from the block during the current year, the Committee have not estimated for any receipt on this account.

6. In last year's report it was intimated that the Estimate for Rents would be increased in the present year by an allowance for ground rent of the School of Practical Science. The Committee learn that no arrangement has yet been concluded in respect to this.

I. (*e*) Fees.

7. It will be observed that there is a considerable increase in the estimate of fees ; this increase being due partly to the higher rates charged, and partly to the fees paid by medical students for instruction in Arts subjects (hitherto credited to Medical Faculty funds). In the estimate is also included the sums payable by students as Laboratory Supply Fees in the departments of Chemistry, Biology, Physics, Mineralogy and Geology and Psychology. These fees in Chemistry, Biology and Mineralogy and Geology were formerly paid to the professors in those departments, and directly expended by them for supplies.

As by a Statute recently passed these fees are now payable with other fees to the Registrar, it is recommended that in future the appropriations for expenditures in this connection be made by this Committee in the usual way.

8. The estimate is further increased by the anticipated receipt, during the current year of $1,400, to be paid by the Government as a reimbursement to the University for the expense attendant upon the examinations for degrees in Agriculture, which have been conducted by the University for some years past (as appears by the report of last year), without any return in the shape of fees. The Committee learn that there is a probability of the matter being arranged in a short time, and they have therefore included the above sum in the estimates.

9. As was the case last year, a deduction of $400 to go to the Medical Faculty appears in the estimate.

10. The following is a detailed statement of the fees received during the year 1891-2, with the Registrar's estimate of the probable receipts for the current year :

TABULATED STATEMENT OF FEES RECEIVED.

	Estimates for 1892-3.	1891-2.
	$	$
Lecture Fees in University College	16,000	12,042
Examination Fees, Faculty of Arts	6,000	5,544
Degree Fees do	1,250	1,215
Matriculation Fees do	175	.....
Examination Fees, Faculty of Law	150	137
Degree Fees do	250	260
Matriculation Fees, Faculty of Medicine	125	141
Examination Fees do	1,600	1,644
Degree Fees do	1,200	1,120
Examination and Degree Fees, Dentistry	400	335
Degree Fees, Engineering and Applied Science	50	40
Examination and Degree Fees, Music	50	15
do do Pharmacy	700	543
Examination and Degree Fees, Agriculture (including arrears of former years to be paid by the Government)	1,400	.....
Fees for Dispensation, Honor Certificates, etc	300	273
Laboratory Supply Fees	1,200	.....
Library Fees	1,600	.....
Medical students, instruction in Art subjects	2,315	.....
do Laboratory Supply Fees	810	.....
	35,575	23,309

II. (*a*, *b*) ABNORMAL RECEIPTS.

11. The item of Abnormal Receipts is composed of (*a*) the unexpended balance of last year's Abnormal Receipts account, amounting to $6,999.16, and (*b*) the unexpended balance of the ordinary revenue of last year, amounting to $2,475.15. The Committee have followed the plan adopted last year in devoting, as far as possible, these receipts to special services.

PROFIT FROM GUARANTEED DEBENTURES.

12. In the Chancellor's letter, prefixed to last year's report, it was conjectured that there would be a profit of $1,500 by investing $100,000, part of the proceeds of the Guaranteed Debentures. No sale of the Debentnres having been yet made, the Committee do not feel justified in making any allowance on this account in the estimates.

RECOMMENDATIONS REGARDING EXPENDITURES.

13. The following recommendations are made:

(*a*) That all stationery and postage stamps required in the service, except in the case of the Bursar's office, be obtained through the Registrar.

(*b*) That every officer through whom expenditures are incurred must, in the first instance, send a requisition for the Bursar's signature in accordance with the following form:

No.....

UNIVERSITY OF TORONTO, AND UNIVERSITY COLLEGE.

REQUISITION FOR SUPPLIES.

(*To be furnished in duplicate.*)

Quantity.	Articles.	Probable Cost.	
		$	c.

Date.....

Signed.....

Examined and Approved,

....

Charge to..... ....*Dept.* *Bursar.*

REMARKS:

This requisition to be in duplicate; one copy to be retained by the Bursar, the other returned by him to the officer.

14. Annexed hereto are the summaries and details of the estimates of expenditure, the amount of which, it will be observed, is $2,355.51 less than the available revenue.

J. LOUDON,
Chairman.

Summary of Estimated Expenditure, Year 1892-3.

	Payable out of interest on special funds and reserve for scholarships.	Payable out of abnormal receipts.	Payable out of ordinary income.	Expenditure, 1891-92.
	$ c.	$ c.	$ c.	$ c.
1. Salaries and pensions:				
(*a*) Salaries (inclusive of Bursar's Office and of Retirement Fund)	... ...	... ...	80,524 56	73,189 61
(*b*) Pensions and gratuities	... ...	... ...	2,402 33	1,144 00
2. Bursar's office (exclusive of Salaries now appearing in salaries statement) $1,200				
Of which one-quarter to U. C. College 300				
Three-quarters to University $900	... ...	... ...	900 00	903 87
3. Expenses *re* investments etc	... ...	... ...	1,000 00	709 08
4. Scholarships	2,197 50	... ...	... ...	1,225 00
5. Examiners	... ...	... ...	6,264 70	6,576 78
6. Library (exclusive of salaries):				
Revote of unexpended balance 1891-92	... ...	1,039 88		
Customary grant	... ...	... ...	2,600 00	1,560 12
Maintenance of building	... ...	... ...	925 00	
Expenses incidental to moving and restoration	230 00	... ...	... ...	2,324 50
Furnishing and fittings	1,231 25			
7. Telephones	... ...	... ...	145 00	104 59
8. Insurance	... ...	... ...	500 00	3,127 55
9. Main Building:				
(*a*) Repairs, maintenance of structure, etc., fuel, water and gas, (salaries excluded)	... ...	... ...	4,260 00	2,678 53
(*b*) Registrar's office	... ...	50 00	75 00	
(*c*) Furnishing	... ...	887 25		
10. Grounds (exclusive of salaries):				
Revote of unexpended balance, 1891-92	... ...	322 12		
Occasional labor, roads, fences and sidewalks (including snow cleaning)	... ...	... ...	2,200 00	677 88
11. Chemical Department:				
Maintenance, materials for lectures, etc., (including students' supplies)	... ...	... ...	508 00	389 76
Revote of unexpended balance, special appropriation for apparatus, 1891-92	... ...	408 51	... ...	480 31
Examination apparatus	... ...	... ...	... ...	220 00
12. Biological Department:				
Repairs, maintenance of structure, fuel, water, gas etc.	... ...	... ...	1,670 00	1,407 65
Gas and other fittings	... ...	165 00		
Laboratory, lecture-room, museum and students' supplies	... ...	... ...	1,177 00	328 88
Microscopes and fittings	... ...	470 00		
Revote of grant for apparatus for Physiological branch 1891-92	... ...	800 00		
Museum wing, for completion	... ...	... ...	... ...	4,779 53
13. Physical Department:				
Maintenance	... ...	... ...	325 00	329 48
Fittings for workshop and laboratory	... ...	... ...	... ...	949 13
Carried forward	3,658 75	4,142 76	105,476 59	103,106 25

SUMMARY OF ESTIMATED EXPENDITURE, YEAR 1892-3.—*Continued.*

	Payable out of interest on special funds and reserve for scholarships.	Payable out of abnormal receipts.	Payable out of ordinary income.	Expenditure, 1891-92.
	$ c.	$ c.	$ c	$ c.
Brought forward	3,658 75	4,142 76	105,476 59	103,106 25
14. Mineralogical and Geological Department ;				
Maintenance, (including students' supplies)			200 00	53 83
Revote of grant for instruments, 1891-92		350 00		
Fittings, etc				727 12
15. Ethnological Museum :				
Sundries				13 88
16. Psychological Department :				
Revote of unexpended balance of maintenance grant, 1891-92		150 93		149 07
Maintenance, new apparatus, books, charts, etc		435 00	10 00	
Fittings				330 65
Revote of unexpended balance of apparatus grant, 1891-92		180 79		919 21
17. Stationery, University			900 00	884 01
18. Printing, University			2,500 00	2,199 61 439 80
19. Advertising, University			200 00	92 50
20. Incidentals, University			150 00	134 00
21. Stationery, University College			125 00	47 58
22. Printing, University College			100 00	113 57
23. Advertising, University College			100 00	42 00
24. Incidentals, University College			100 00	50 92
25. Mathematics, apparatus (re-vote)		704 37		45 63
26. Political Science, class-room supplies			25 00	
27. Classics, class-room supplies			37 00	12 00
28. English, class-room supplies (re-vote)		19 00		
29. French, class-room supplies			31 00	38 38
30. German, class-room supplies			35 00	44 49
31. Italian and Spanish, class-room supplies, etc			35 00	23 33
32. Oriental Literature, class-room supplies			25 00	16 58
Totals	3,658 75	5,982 85	110,049 59	109,484 41

Total estimated expenditure,	$119,691 19
from which deduct the expenditure out of Interest on Special Funds, already provided for in deductions from Receipts account	3,658 75
	$116,032 44
Total available revenue (p. 5)	118,387 95
Balance	$2,355 51

Detailed Estimate of Expenditure, Year 1892-3.

Salaries.	Estimated amount year ending 30th June, 1893.	Amount paid year ending 30th June 1892.
	$ c.	$ c.
1. Bursars Office :		
Bursar.		
To officer	2,200 00	2,200 00
Reserved for Retirement Fund	200 00	150 00
Clerk	500 00	500 00
Book-keeper	200 00	200 00
Boy	125 00	110 00
	3,225 00	3,160 00
One-quarter to U. C. College, three-quarters to University.	2,418 75	2,366 25
2. Library.		
Librarian (salary @ $1,200, for six months $600)		
do $1,300, do $650)		
To officer	1,181 25	517 50
Reserved for Retirement Fund	68 75	54 15
Librarian (acting) salary @ $700 for six months		350 00
Assistant Librarian (paid as Assistant Registrar) .		
Student Assistant (salary @ $22.50 per month for 8 months	180 00	120 00
do do do $15.00 do do	120 00	120 00
do do do $15.00 do do	120 00	
Caretaker (salary as Porter for 3 months $125)		
(salary @ $500 for 9 months $375)	500 00	
Superintendent of Library (salary for 26 weeks @ 15 per week)	390 00	
Clerk	300 00	
Catalogue Clerk	300 00	
	3,160 00	1,161 65
3. General as between University and University College.		
President (also paid as Professor of Physics salary @ $1,800 for 9½ months	1,425 00	
do the late Sir Daniel Wilson, one month's salary and house rent	550 00	2,200 00
Janitor	504 00	504 00
do as Sunday Constable	25 00	25 00
Gardener .	420 00	420 00
do as Sunday Constable	25 00	25 00
Engineer (with rooms and fuel)	576 00	576 00
Fireman (salary for 26 weeks @ $10.50 per week).	273 00	213 16
Superintendent of Electrical Plant (paid as Mechanical Assistant ; Physics)		
Attendant (salary for 8½ months @ $32.00 per month), ... $272		
do 1 do $28.00 do 28		
	300 00	208 00
Charwoman	312 00	312 00
do (salary for 38 weeks at $7 per week	266 00	204 20
	4,676 00	4,687 36
4. Pensions and gratuities :		
J. M. Hirschfelder	1,000 00	1,000 00
George Goodwin	144 00	144 00
Gratuity to the representatives of the late Sir Daniel Wilson	833 33	
do do do Robert McKim	425 00	
	2,402 33	1,144 00
5. University of Toronto, General :		
(*a*) Vice-Chancellor	400 00	400 00
Bedel and Attendant on Senate (also paid as Bedel, University College, salary from 9th September, @ $700 per annum	568 65	
do R. McKim, 1 month	70 83	340 00
Architect	100 00	100 00
(*b*) Registrar's Office :		
Registrar (also paid as Registrar, University College and Secretary to University College Council)		503 35
Assistant Registrar (salary @ $700)	700 00	350 00
Registrar's Assistant	200 00	200 00
	2,039 48	1,893 35

DETAILED ESTIMATE OF EXPENDITURE, YEAR 1892-3.—*Continued.*

SALARIES.	Estimated amount year ending 30th June, 1893.	Amount paid year ending 30th June, 1892.
	$ c.	$ c.
6. Teaching staff, etc., University of Toronto:		
(*a*) Modern History		2,800 00
Lecturer (salary at $1,500 for 9 months, $1,125).		
To officer	1,059 37	
Reserved for Retirement Fund	65 63	
	1,125 00	2,800 00
(*b*) Political Science:		
Professor (salary @ $2,500, for 9 months $1,875).		
To officer	1,740 00	2,936 25
Reserved for Retirement Fund	135 00	213 75
Lecturer, Temporary (salary @ $1,000 for 9 months)	750 00	
Professor of Constitutional and International Law	1,000 00	1,000 00
Professor of Roman Law, Jurisprudence and History of English Law	1,000 00	1,000 00
Fellow in Political Science		500 00
	4,625 00	5,650 00
(*c*) Mathematics:		
Professor (salary @ $2,700, for 3 months ... $675 do $3,000 9 do ... 2,250 $2,925.00		
To officer, for July—Sept., $603.75, for Oct—June $2,036.25	2,640 00	2,436 25
Reserved for Retirement Fund	285 00	213 75
Lecturer (Salary @ $800, for 9 months $600.		
To officer	570 00	
Reserved for Retirement Fund	30 00	
Fellow	500 00	500 00
Fellow		375 00
	4,025 00	3,525 00
(*d*) Physics:		
Professor, paid also as President (salary at $3,200 per annum.)		
To officer	2,915 00	3,100 00
Reserved for Retirement Fund	285 00	75 00
Demonstrator, salary at $1,700.		
To officer	1,597 50	1,573 13
Reserved for Retirement Fund	102 50	76 87
Lecturer, salary at $800, for 9 months $600.		
To officer	570 00	
Reserved for Retirement Fund	30 00	
Assistant Demonstrator, salary at $700, for 9 months $525.		
To officer	498 75	
Reserved for Retirement Fund	26 25	
Fellow	500 00	500 00
Temporary Assistant Lecturer		400 00
Mechanical Assistant (also Superintendent of Electrical plant)	800 00	800 00
	7,325 00	6,525 00
(*e*) Chemistry:		
Professor.		
To officer	3,100 00	3,100 00
Reserved for Retirement Fund	100 00	75 00
Demonstrator.		
To officer	760 00	520 00
Reserved for Retirement Fund	40 00	30 00
Demonstrator (salary at $500, for 9 months $375)	375 00	
Fellow	500 00	500 00
Lecture Assistant	200 00	200 00
do (Temporary)	200 00	
Attendant	504 00	504 00
	5,779 00	4,929 00

Detailed Estimate of Expenditure, Year 1892-3.

Salaries.	Estimated amount year ending 30th June, 1893.	Amount paid year ending 30th June, 1892.
	$ c.	$ c.
(*f*) Mineralogy and Geology:		
Professor	3,100 00	3,100 00
Fellow	500 00	500 00
Attendant	200 00	200 00
	3,800 00	3,800 00
(*g*) Biology:		
Professor (Salary $3,200).		
To officer	2,915 00	2,961 25
Reserved for Retirement Fund	285 00	213 75
Associate Professor of Physiology (salary for 3 months at $1,700, $425.		
do do do 9 do $1,800, $1,350.		
To officer	1,666 87	1,573 13
Reserved for Retirement Fund, 3 months at $102.50, $25.63; 9 months at $110, $82.50—$108.13	108 13	76 87
Lecturer, salary $800, for 9 months=$600.		
To officer	570 00	
Reserved for Retirement Fund	30 00	
Assistant Demonstrator, salary $500, for 9 months	375 00	
Fellow	500 00	500 00
Sub-curator of Museum, etc	524 00	524 00
Attendant and Caretaker of Biological Buildings	480 00	480 00
Boy, cleaner, etc	120 00	88 00
	7,574 00	6,417 00
(*h*) Italian and Spanish:		
Associate Professor, salary for 3 months at $1,700, $425.		
do 9 do $1,800, $1,350.		
To officer	1,666 87	1,573 13
Reserved for Retirement Fund	108 13	76 87
Fellow	500 00	437 50
	2,275 00	2,087 50
(*i*) Logic and Metaphysics:		
Professor, salary $3,200.		
To officer	2,915 00	2,936 25
Reserved for Retirement Fund	285 00	213 75
Lecturer and Demonstrator in Philosophy, salary $800, for 9 months $600; replacing Fellow in Philosophy (half)		250 00
To officer	570 00	
Reserved for Retirement Fund	30 00	
	3,800 00	3,400 00
(7) Teaching staff, etc.., University College:		
(*k*) Ethics:		
Professor, salary $3,000.		
To officer	2,745 00	2,058 75
Reserved for Retirement Fund	255 00	191 25
Fellow in Philosophy (half)		250 00
	3,000 00	2,500 00
(*l*) Greek:		
Professor, salary $3,200.		
To officer	2,915 00	2,961 25
Reserved for Retirement Fund	285 00	213 75
Lecturer, salary, $1,700.		
To officer	1,597 50	1,573 13
Reserved for Retirement Fund	102 50	76 87
	4,900 00	4,825 00

DETAILED ESTIMATE OF EXPENDITURE, YEAR 1892-3.—*Continued.*

SALARIES.	Estimated amount year ending 30th June, 1893.	Amount paid year ending 30th June, 1892.
	$ c.	$ c.
(*m*) Latin :		
Associate Professor, salary for 3 months at $1,700, $425.		
" 9 do $1,800, $1,350.	1,666 87	1,567 50
To officer	108 13	82 50
Reserved for Retirement Fund		
Lecturer, salary for 3 months at $800, $200.		
do 9 do $900, $675.	831 25	570 00
To officer	43 75	30 00
Reserved for Retirement Fund	500 00	500 00
Fellow	3,150 00	2,750 00
(*n*) Oriental Literature :	$ c.	$ c.
Professor, salary for 3 months at $2,200, $550.		
" 9 " $2,500, $1,875.	2,262 50	2,037 50
To officer		
Reserved for Retirement Fund, 3 months @ $150, $37.50 ; 9 months at $180, $135 ; total, $162.50	162 50	112 50
Lecturer, salary for 9 months @ $800, $600 ; replacing Fellow of 1891-92	570 00	437 50
To officer	30 00	
Reserved for Retirement Fund	3,025 00	2,587 50
(*o*) English :		
Professor, salary, $3,200.	2,915 00	2,936 25
To officer	285 00	213 75
Reserved for Retirement Fund		
Lecturer, salary, $1,700.	1,597 50	1,573 13
To officer	102 50	76 87
Reserved for Retirement Fund	4,900 00	4,800 00
(*p*) French :		
Associate Professor, salary for 3 months @ $1,700, $425.		
" Professor, " 9 " $1,800, $1,350.	1,166 87	1,573 13
To officer	108 13	76 87
Reserved for Retirement Fund		
Lecturer, salary for 3 months @ $800, $200.		
" 9 " $900, $675.	831 25	570 00
To officer	43 75	30 00
Reserved for Retirement Fund	500 00	500 00
Fellow	3,150 00	2,750 00
(*q*) German :		
Associate Professor, salary, $2,000.	2,000 00	2,000 00
To officer		
Reserved for Retirement Fund		
Lecturer, salary for 3 months @ $800, $200.		
" 9 " $900, $675.	831 25	570 00
To officer	43 75	30 00
Reserved for Retirement Fund	500 00	500 00
Fellow	3,375 00	3,100 00
8. University College, general :		
Registrar (also paid as Registrar University)		125 00
Bedel (also paid as Bedel University)		510 00
		635 00

Detailed Estimate of Expenditure, Year 1892-3.

Expenses.	Payable out of interest on special funds.	Payable out of abnormal receipt.	Payable out of ordinary revenue.	Amount paid 1891-92.
(*Report page 12.*)	$ c.	$ c.	$ c.	$ c.
2. Bursar's Office (exclusive of salaries now in salary list).				
Allowance to cover gas, fuel and attendance	.....	.....	100 00	100 00
Stationery, printing, postage and incidentals	.....	.....	700 00	700 15
Allowance for rent of office	.....	.....	400 00	400 00
	.....	.....	1,200 00	1,200 15
¼ to U. C. College, ¾ to University	.....	.....	900 00	903 87
3. Expenses *re* Investments, etc. :				
Law costs	.....	.....	700 00	370 78
General incidentals (including commission on loans)	.....	.....	300 00	338 30
			1,000 00	709 08
4. Scholarships :				
Junior Matriculation :				
1. Prince of Wales	50 00	.....	.....	50 00
1a. General Proficiency, one half ultimate value	30 00			
2. do do do	27 50			
3. do do do	25 00			
4. do do do	22 50			
5. do do do	20 00			
6. do do do	17 50			
7. do do do	15 00			
8. do West Durham, full value	25 00			
1. Classics and Mathematics, one-half ultimate value	30 00			
2. do do do do	20 00			
1. Classics and Moderns, do do	30 00			
2. do do do do	27 50			
3. do do do do	20 00			
4. do do do do	17 50			
1. Mathematics and Moderns, one-half ultimate value	30 00			
2. " " " "	20 00			
1. Mathematics and Science " "	30 00			
2. " " " "	20 00			
1. Moderns and Science " "	30 00			
2. " " " "	20 00			
1. Classics—Mary Mulock– full value	60 00			
2. " " "	60 00	.....	.....	120 00
1. Mathematics, one half alternate value	30 00			
2. " " "	15 00			
1. Moderns " "	30 00			
2. " " "	15 00			
1. Science " "	30 00			
2. " " "	15 00			
First year :				
Classics (Moss Scholarship)	120 00	.....	.....	120 00
Political Science (Bankers' Scholarship)	70 00	.....	.....	70 00
Second year :				
Classics (William Mulock Scholarship)	60 00	.....	.....	60 00
Mathematics " "	60 00	.....	.....	60 00
Modern Languages (George Brown Scholarship)	60 00	.....	.....	60 00
Philosophy (John Macdonald Scholarship)	50 00	.....	.....	50 00
Political Science (Blake Scholarship) No. 1	75 00	.....	.....	75 00
" " " " No. 2	50 00	.....	.....	50 0

DETAILED ESTIMATE OF EXPENDITURE, YEAR 1892-3.—*Continued.*

EXPENSES.	Payable out of interest on special funds.	Payable out of abnormal receipts.	Payable out of ordinary revenue.	Amount paid, 1891-2.
	$ c.	$ c.	$ c.	$ c.
Third year.				
German (Julius Rossin Scholarship)	60 00			60 00
Political Science (Blake Scholarship) No. 1	75 00			75 00
" " " " No. 2	50 00			50 00
Philosophy (John Macdonald Scholarship)	60 00			
Physics, No. 1	100 00			100 00
" No. 2	45 00			45 00
Chemistry and Mineralogy (Daniel Wilson Scholarship)	60 00			60 00
Natural Science " "	60 00			60 00
Post-graduate:				
Political Economy (Ramsay Scholarship)	60 00			60 00
Medicine (George Brown Memorial Scholarship)	300 00			
	2,197 50			1,225 00
5. Examiners:				
Arts			3,100 00	
" (supplemental)			950 00	3,152 52
Medicine			750 00	1,142 15
" (supplemental)			275 60	792 17
Law			140 00	200 00
Engineering and Applied Science			40 00	327 85
Dentistry			225 00	20 00
Agriculture			240 00	259 75
Music			40 00	257 75
Pharmacy			275 00	40 00
Matriculation			229 10	155 49
				229 10
			6,264 70	6,576 78
6. Library (exclusive of salaries):				
Revote of unexpended balance, 1891-92		1,039 88		
Customary grant			2,600 00	1,560 12
Expenses incidental to moving	230 00			2,324 50
Maintenance: Fuel $ 600 00				
Water 150 00				
Extra cleaners 75 00				
Incidentals 100 00			925 00	
Furnishings and fittings (details in Librarian's report)	1,231 25			
	1,461 25	1,039 88	3,525 00	3,884 62
7. Telephones.				
University (main building)			30 00	30 00
Library			40 00	
Biological building			30 00	30 00
Bursar's office			45 00	44 59
			145 00	104 59
8. Insurance			500 00	3,127 55

DETAILED STATEMENT OF EXPENDITURE, YEAR 1892-3.—*Continued.*

EXPENSES.	Payable out of abnormal receipt.	Payable out of ordinary revenue.	Amount paid 1891-92.
	$ c.	$ c.	$ c.
9. Main Building :			
(*a* Maintenance : Repairs (carpentry and plumbing, occasional labor and sundries)	.....	700 00	526 62
Fuel	.....	3,060 00	1,803 35
Water	.....	350 00	320 12
Gas	.....	150 00	28 44
(*b*) Registrar's Office :			
Shelving	50 00		
Petty cash	.....	75 00	
(*c*) Furnishing (details in Council's report)	887 25		
	937 25	4,335 00	2,678 53
10. Grounds :			
Revote of unexpended balance 1891-92	322 12		
Occasional labor, roads, fences, sidewalks, etc	.....	2,200 00	677 88
	322 12	2,200 00	677 88
11. Chemical Department : Maintenance—			
Chemicals	.....	250 00	
Material other than chemicals	.....	30 00	
Glass apparatus used in lectures	.....	55 00	389 76
Repairs	.....	35 00	
Incidentals	.....	20 00	
Students' laboratory supplies	.....	118 00	
Revote of unexpended balance of apparatus grant	408 51	.....	480 31
Examination apparatus	.....	.....	220 00
	408 51	508 00	1,090 7
12. Biological Buildings, Maintenance of structure :			
Repairs, including carpentry and plumbing	.....	200 00	
Gas, water and electric light fittings	165 00		
Additional cleaning assistance (exclusive of mineralogical and anatomical rooms)	.....	150 00	
Fuel	.....	900 00	
Gas	.....	120 00	
Water	.....	200 00	
House furnishings and cleaning materials	.....	100 00	
	165 00	1,670 00	1,407 65
Biological Department :			
Laboratory, lecture-room and museum supplies	.....	425 00	328 88
Students' laboratory supplies	.....	752 00	
Microscopes and fittings	470 00		
Revote of grant for apparatus for physiological branch	800 00		
	1,270 00	1,177 00	328 88
NOTE.—$1,865 is required for fittings for the Museum, but as the amount is properly payable out of the capital of the Museum Insurance Fund it is not estimated for here.			
13. Physical Department : Maintenance—			
Chemicals (alcohol, acids, mercury, etc.) $75 00			
Electrical supplies (wire, etc.) 75 00			
Glass vessels, prisms, rubber, etc 60 00			
Drawing paper, etc 15 00			
Dusters 5 00			
Materials for making and repairing instruments 20 00			
Carpenter's work and materials 35 00			
Freight 20 00			
Sundries 20 00			
		325 00	329 48
Fittings for workshop and laboratory	.....	.....	949 13
		325 0.	,278 61

DETAILED STATEMENT OF EXPENDITURE, YEAR 1892-3.—*Continued.*

EXPENSES.	Payable out of abnormal receipt.	Payable out of ordinary revenue.	Amount paid, 1891-2.
	$ c.	$ c.	$ c.
14. Mineralogical and Geological Department:			
Supplies and sundries, including students' supplies	.....	200 00	53 82
Revote of grant for new instruments, 1891-92	350 00		
Fittings	.....	.....	727 12
	350 00	200 00	780 94
15. Ethnological Museum:			
Sundries	.....	.....	13 88
16. Psychological Department: (*a*) Maintenance—			
Revote of unexpended balance of maintenance grant, 1891-92	150 93	.....	149 07
New apparatus, books, charts, blank-books, etc	435 00	10 00	
(*b*) Revote of unexpended balance of apparatus grant, 1891-92	180 79	.....	919 21
(*c*) Fittings	.....	.....	330 65
	766 72	10 00	1,398 93
NOTE.—A mimeograph is also asked for. It is recommended that the mimeograph of the Physical Department be utilized.			
17. Stationery (University):			
Office supplies, papers for examinations, postage, etc.	.....	900 00	884 01
18. Printing (University)	.....	2,500 00	2,199 61
Calendar	.....	.....	439 80
19. Advertising (University)	.....	200 00	92 50
20. Incidentals (University)	.....	150 00	134 00
21. Stationery (University College)	.....	125 00	47 58
22. Printing (University College)	....	100 00	113 57
23. Advertising (University College)	.....	100 00	42 00
24. Incidentals (University College)	.....	100 00	50 92
25. Mathematics:			
Re-vote of unexpended balance of grant for models	704 37	.....	45 63
26. Political Science:			
Class room supplies	.....	25 00	
27. Classics:			
Books for class room use	.....	37 00	12 00
28. English:			
Re-vote of grant of 1891-2	19 00		
29. French:			
Books for class room use	.....	31 00	38 38
30. German:			
Books for class room use	.....	35 00	44 49
31. Italian and Spanish:			
Books for class room use	.....	15 00	
Mimeograph	.....	20 00	23 33
32. Oriental Literature:			
Books for class room use	.....	25 00	16 58

120 Simcoe Street, Toronto,
17th November, 1892.

JAMES BREBNER, ESQ.,
Assistant Registrar,
University of Toronto.

DEAR SIR,—At a meeting of the Board of Trustees held to-day, the President submitted the draft Report of the Committee of the Senate on Finance, containing estimates of revenue and expenditure, and their observations on various matters. The following minute was made:

"Moved by Mr. Scott, seconded by the President, and

"*Resolved*, that the Board approves of the Report of the Finance Committee of the University of Toronto."

Yours truly,

J. E. BERKELEY SMITH,
Bursar.

EIGHTEENTH ANNUAL REPORT

OF THE

ONTARIO AGRICULTURAL COLLEGE

AND

EXPERIMENTAL FARM

1892.

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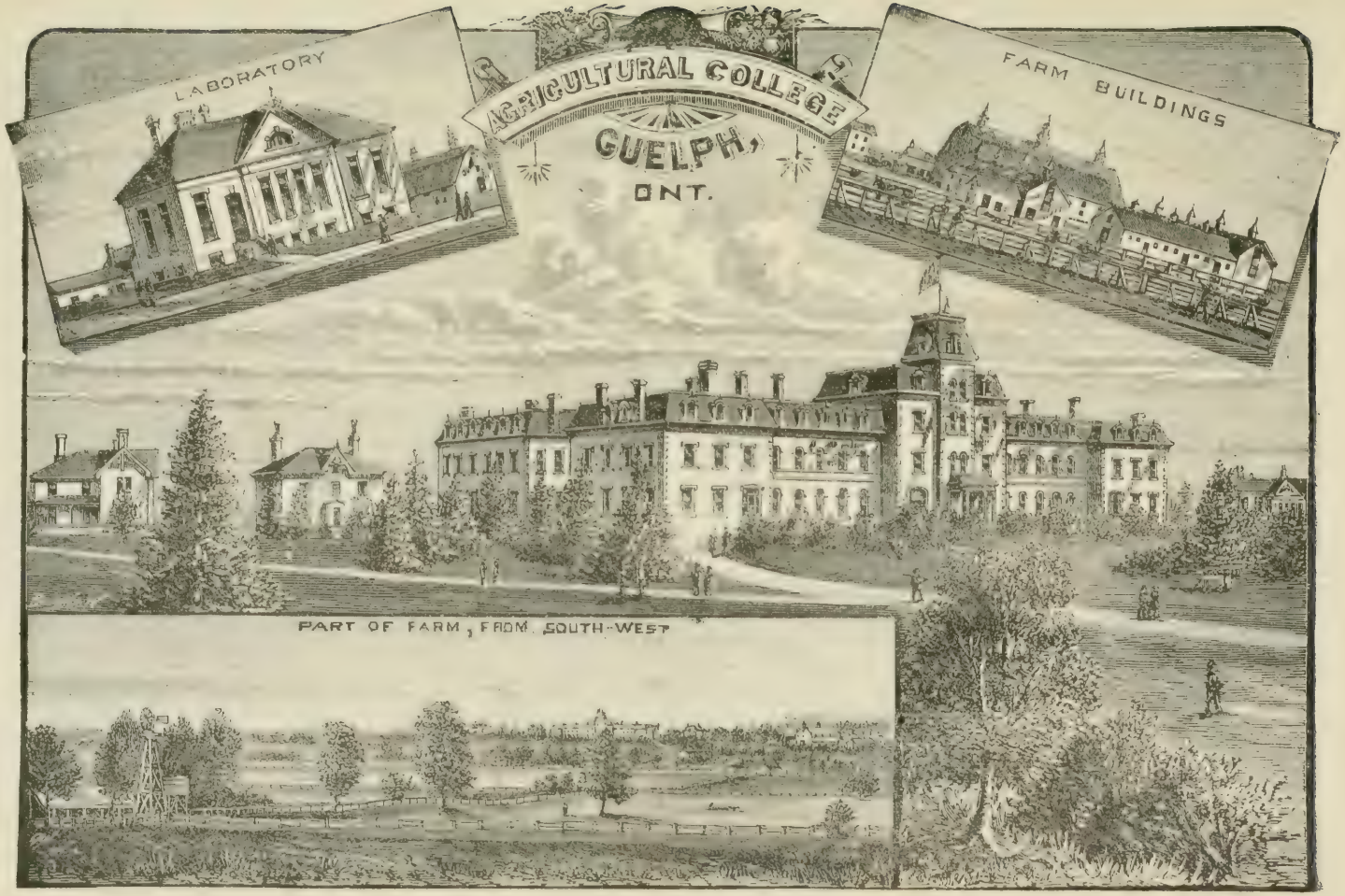
LABORATORY
AGRICULTURAL COLLEGE
GUELPH,
ONT.
FARM BUILDINGS
PART OF FARM, FROM SOUTH-WEST

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EIGHTEENTH ANNUAL REPORT

OF THE

ONTARIO AGRICULTURAL COLLEGE

AND EXPERIMENTAL FARM.

GUELPH, January 2nd, 1893.

To the Honorable JOHN DRYDEN,
Minister of Agriculture.

DEAR SIR,—I have the honor to transmit herewith the Eighteenth Annual Report of the Ontario Agricultural College and Experimental Farm.

In this Report we have reviewed briefly the work of the year 1892 under the following heads :

PART I.—REPORT OF THE PRESIDENT.

PART II.—REPORT OF THE PROFESSOR OF GEOLOGY AND NATURAL HISTORY.

PART III.—REPORT OF THE PROFESSOR OF CHEMISTRY.

PART IV.—REPORT OF THE PROFESSOR OF VETERINARY SCIENCE.

PART V.—REPORT OF THE FOREMAN OF THE HORTICULTURAL DEPARTMENT.

PART VI.—REPORT OF THE PHYSICIAN.

PART VII.—REPORT OF THE PROFESSOR OF AGRICULTURE AND FARM SUPERINTENDENT.

PART VIII.—REPORT OF THE PROFESSOR OF DAIRYING.

I have the honor to be, Sir,
Your obedient servant,

JAMES MILLS,
President.

MINISTER OF AGRICULTURE

Hon. John Dryden, Toronto.

Ontario Agricultural College and Experimental Farm, Guelph, under control of the Minister of Agriculture.

OFFICERS 1893.

James Mills, M.A. ..... President.
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J. Hoyes Panton, M.A., F.G.S. ..... Professor of Natural History and Geology.
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Captain Walter Clarke ..... Instructor in Drill and Gymnastics.
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H. B. Sharman, B.S.A ..... Assistant Chemist.
A. McCallum ..... Bursar.

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Secretary of Board ..... C. C. James, M.A.

PART I.

REPORT OF THE PRESIDENT.

The year 1892 has been in every sense a very pleasant and prosperous one in the history of the Ontario Agricultural College and Experimental Farm. The ordinary routine of College work has not varied much from that of former years; but we have made gratifying progress along several lines.

Chemical Laboratory.

By the construction of a tank for a regular supply of water and the addition of a considerable amount of new apparatus, the equipment of our chemical laboratory has been much improved. We are now in a position to give a good course of general instruction in chemistry to our first year students, a fair amount of practice in analytic work to our second year men, and, I think I may say, a very broad and thorough training in both theoretical and practical chemistry to candidates for the degree of B.S.A. We still need to fit up a part of the excellent basement under the laboratory proper for practice in elmentary work by the first year men.

Greenhouses and Botanical Laboratory.

Our new greenhouses and botanical laboratory have been finished within the year. The former are now fairly well supplied with economic and ornamental plants for the instruction of our students and the entertainment of visitors; and the latter is furnished and fully equipped for potting, grafting, microscopy, lecture-room work, and original investigation in the Departments of Botany and Horticulture.

We shall soon have a better representation of economic plants in the greenhouses, and an additional house to be divided into sections and set apart specially for practical work and original investigation by our senior students.

Experimental Dairy.

In the Dairy we have made more changes and greater advancement during the year than in any other department. We have made large additions to our dairy building and have furnished it anew with all the appliances necessary for the setting of milk, the handling of cream, and the making of butter and cheese on the most approved methods. We have also made large additions to our dairy stables, so that we now have ordinary stalls for thirty milch cows, with all the box-stalls and pens that we are likely to need for calves and other animals which it may be advisable to keep in this department. We have likewise erected a very nice dairy piggery, a large circular silo, and a building for a tread-power to run a cream separator in connection with the stables.

A fuller account of these additions and alterations will be found in Professor Dean's report in Part VIII. of this volume.

Dairy School.

Our aim in erecting these new buildings and in making the additions and alterations just referred to, was to provide thorough instruction in dairying for our regular students and for others who might wish to come here for a course of lectures, with practical instruction in butter and cheese-making With this object in view we decided to start a special Dairy School on the 1st February, 1893; and on the 15th of last November, we issued the following circular for the information of butter-makers, cheese-makers, and others interested in dairying:

Course in Dairying.

The great importance of the dairy industry and its rapid growth in this Province have induced the Hon. John Dryden, Minister of Agriculture for Ontario, to give this branch of farming special attention within the last two years. Almost immediately after taking office as Minister of the Crown, Mr. Dryden announced his intention of sending a travelling dairy through the country, to give the farmers and their families practical instruction in the art of butter-making. Three of these dairies have been at work during the past summer, and by the end of the year 1893, they will have covered the whole Province. The next step in advance, to which the Minister gave his approval, was the enlargement of our dairy building, with a view to provide thorough instruction in dairying for our regular students, and for others who might wish to avail themselves of a special course of lectures with practical work in butter and cheese-making.

As an outcome of the Minister's action in these matters, we have decided to commence a short course of instruction in dairying at the close of the Farmers' Institute work in January next. In this course we intend to give such theoretical and practical instruction in butter-making and cheese-making as seems to be specially needed by butter makers, cheese makers, and farmers' sons and daughters throughout the Province.

We think the time has come when such a school for special instruction in dairying should be started in this Province—a school in which, at comparatively small cost and without spending too much time, factory men, creamery men, and others can receive valuable lectures and learn from practical object lessons the latest and most approved methods in the two great branches of dairying.

Competition at home and abroad is becoming so keen that those who will not take the trouble to learn the latest and best methods in their respective branches of farming, must soon give up the business and turn their attentoin to something else. The system of payments by results, or according to the quality of the milk supplied, is being introduced by cheese factories, and for this reason it is important that cheese-makers should, as soon as possible, become familiar with the Babcock tester and learn how to distribute fairly the products of their factories on this new plan. Patrons also in many localities are now thinking of altering their factories, so as to make cheese in summer and butter in winter. Consequently the men in charge of these factories should at once learn how to run centrifugal cream separators, handle cream, and make butter according to the most approved methods. For these and other reasons, we have concluded to open a special dairy school in connection with this institution on the 1st of February next; and, by delivering lectures on the principles of dairying, by illustrating the best methods of manufacturing butter and cheese on the factory and private dairy plans, by explaining the various methods of testing the quality of milk, by exhibiting samples of the principal breeds of dairy cows, by showing how such cows are fed and managed, by bringing factorymen and others who may wish to learn something about butter and cheese-making, into contact with men and methods that may be new and helpful—by these means we hope to impart useful information and infuse new life into the dairy industry throughout this Province.

Buildings and Equipment.

Our dairy building is divided into two sections—one for butter and the other for cheese. On the ground floor of the end devoted to butter making there is an office occupied by the Professor of Dairying, and containing a number of books of reference for the use of both students and officers of the dairy department. There is also a large class-room with elevated seats looking into the butter-room, in which there are two hand cream separators, a power separator, a butter extractor, a Boyd starter, milk and cream vats, churns, butter-workers,

printers, and other things required for instruction in butter-making. Close by, on the same floor, there is a milk testing room, equipped with Babcock testers, a Beimling tester, a set of lactometers, and other simpler testers sometimes used to determine the quality of milk. Also, under this end of the building, there is a dairy cellar, which contains a refrigerator, a store-room, a wash-room, and all the boxes, creamers, and vats necessary to illustrate the different methods of setting milk.

The end of the building set apart for experimental cheese-making contains two rooms—a large cheese-room and a moderate-sized curing-room. At one end of the cheese-room there are elevated seats looking towards the other end, in which the work is to be done ; and in this latter portion there are vats, presses, curd mills, and other things required in cheese-making.

Near by the dairy building there are a dairy piggery, a circular silo, a commodious cow stable, and a small building containing a tread-power, on which a bull is to be used for cutting feed, pulping roots, and running a cream separator.

Instructors.

The following instructors will take charge of the work under the general oversight and control of H. H. Dean, B.S.A., our Professor of Dairying :

1. *In Butter-making—*

F. C. Rogers—To give instruction in the setting of milk, the handling of cream, and the churning, salting, working, printing and packing of butter.

F. B. Linfeld, B.S.A.—To take charge of the separators, extractor and other machines.

2. *In Cheese-making—*

Adam Bell, Instructor in Dairy School of Western Dairymen's Association at Tavistock—to give instruction in making and curing cheese.

T. B. Miller, Inspector and Travelling Instructor under Western Dairymen's Association—to assist Mr. Bell in the cheese department.

3. *Milk Testing—*

W. J. Palmer, B.S.A.—To give instruction in testing milk with the Babcock tester, the Beimling tester, the lactometer, lactoscope, etc.

Course of Study.

The school will open on the 1st February and close on the 31st March, 1893 ; and a course of fifty lectures will be given as follows :

Professor of Dairying.—Twenty-eight lectures on breeds of dairy cattle ; selection, breeding, feeding, and care of dairy cows, with illustrations by reference to our dairy herd of Ayrshires, Holsteins, Jerseys, Guernseys, Red Polls, and a number of Grades ; composition of milk ; ferments in milk ; butter and cheese ; the marketing of dairy products, etc., etc.

Professor of Agriculture.—Four lectures on general agriculture.

Professor of Veterinary Science.—Four lectures on veterinary science, including common diseases of the cow.

Professor of Biology.—Four lectures—two on geology and two on botany.

Professor of Chemistry.—Four lectures on the nomenclature and general principles of chemistry.

Mathematical Master.—Six lectures on mathematics and book-keeping, explaining fully the decimal system.

Practical Work.

Students will be sent in rotation to (1) butter-making, (2) cheese-making, and (3) milk-testing. Work will commence immediately after the morning lecture, and continue until each student has finished the work assigned for the day.

In the butter department full and detailed instruction will be given in the operation of cream separators, butter extractor, and other machines, and in the handling of cream, the making, printing, and packing of butter, etc. In the cheese-room, lectures with practical object lessons, will be given daily on the best methods of making cheese on the factory plan, the use of rennet tests, the proper care and curing of cheese, etc. Likewise, in the milk-testing room, full information, with practice in the testing of milk, will be given daily throughout the course.

Further, some time will be devoted to the judging of butter and cheese. Samples will be obtained from day to day. The students will be required to judge them by points, and their judgment will be compared with that of experts.

Ladies Invited.

Ladies are invited to take this course. They may either take the full work, or confine their attention to milk-testing and butter-making ; and, this being the first time that we have opened the College to ladies, it is hoped that some will avail themselves of the opportunity now offered.

Terms of Admission, Cost, etc.

No Entrance Examination will be required for this Course.

Tuition.—Free to residents of the Province of Ontario ; to non-residents, $5 for the course.

Incidentals.—A payment of $5 in advance for incidental expenses, will be required of all students in this course. Also, a deposit of $2 to cover possible breakage. This sum of $2, or a portion of it, if not required for breakage, will be refunded when the student leaves.

Board and lodging can be obtained in Guelph (a mile and a half from the College) at $3 to $3.50 a week, and at $3 a week for a limited number close to the College grounds.

Working Clothes.—Every student must provide two special suits of clothes to be worn in the Dairy—white and blue gingham dress, with white cap and white apron, for ladies , and white linen or cotton suit, with white cap and white apron, for young men.

Applications for admission should be addressed to the President of the College. For the first year we can accommodate only 50 ; and we shall take them in the order of application, with this proviso, that a preference will be given to candidates from Ontario.

Candidates whose applications are accepted will be expected here on the first day of the course ; and all students will be required to attend the lectures and practical work regularly and punctually while they remain at the school.

Travelling Dairies.

Again, by order of the Minister of Agriculture, we sent out three Travelling Dairies early in the month of May—one west, and two through the eastern part of the Province. W. J. Palmer, B.S.A., took charge of one ; F. B. Linfield, B.S.A., of another ; and P. H. McIntosh, of a third.

Mr. Palmer, assisted by J. A. McTavish, an experienced butter-maker, held his first meeting near Gananoque on the 2nd of May, and continued his work through the summer and fall, till the 15th December. During this period of 7½ months, he held meetings at 151 places throughout the following counties : Leeds, Grenville, Dundas, Stormont, Glengarry, Carleton, Lanark, Renfrew, Frontenac, Lennox, Addington, Hastings, Prince Edward and Northumberland—14 in all.

Mr. Linfield began at the same time in the county of Wentworth, with Mr Hume as his butter-maker, and remained at his post till the 17th of December—for a period of 7½ months, during which time he held 156 meetings in 14 counties, as follows : Wentworth, Lincoln, Welland, Monck, Haldimand, Brant, Norfolk, Elgin, Kent, Middlesex, Oxford, Perth, Waterloo and Wellington.

Mr. McIntosh, who was not directly under my control, and from whom I have not yet received any report, was sent to hold meetings in the French portions of the counties of Russell, Prescott, Stormont and Carleton.

The work of these dairies has been of great practical benefit to many farmers in the counties visited, and has done much to awaken an intense interest in dairying throughout all parts of the Province. For a full account of the work done by two of them, see reports of Messrs. Palmer and Linfield in Part VIII. of this volume.

Experiments with Live Stock, Grain, Roots, Etc.

Marked progress has been made in this department. Our experimentalist, Mr. C. A. Zavitz, under the supervision of Professor Shaw, has been reaching out and pressing forward in various lines of experimental work, especially in testing different varieties of

grain, not only at our College station, but at various other points throughout the Province. Nearly 150 acres of our farm is now devoted to experimental work—55 acres in small plots, 30 acres in plots of one acre each, and 66 acres in still larger plots.

On the plots at the College Mr. Zavitz has tested 67 varieties of barley, 116 of oats, 61 of peas, 63 of spring wheat, 62 of winter wheat, 76 of fodder corn, 114 of potatoes, 62 of turnips, 38 of mangolds, 10 of sugar beets, 23 of carrots, 18 of clovers, 40 of grasses, 11 of millets, 3 of rape, and 3 of sunflower. He has also tried different dates of seeding on 48 plots, mixtures of grain on 25 plots, application of fertilisers on 60 plots, methods of preparing potatoes for planting on 20 plots, various ways of planting and cultivating fodder corn, roots and potatoes on 233 plots, and a number of other experiments with grain, rape, roots and grasses on 80 plots.

To this may be added some live stock experiments, conducted by Mr. A. Cuppage under the joint supervision of Professor Shaw and Mr. Zavitz, as follows :

With Cattle	6	experiments		20	animals.
" Sheep	3	"		666	"
" Pigs	1	"		12	"

In addition to the experiments at the College, the following valuable work has been done under the control and supervision of our experimental department :

Co-operative Experiments conducted by members of the Ontario Agricultural and Experimental Union and other interested farmers throughout Ontario :

Number of experiment.	Names of experiments.	Number of plots required for each test.		Plots used for these tests during 1892. By Ontario Experiment Station.	Plots used for these tests during 1892. By farmers over Ontario.
1	Testing nitrate of soda, superphosphates, muriate of potash, mixture, and no manure with oats	4	Fertilizers	14	165
2	Comparing the advantage of nitrate of soda over no fertilizer with rape	2			
3	Ascertaining the relative value of three varieties of millet	3	Fodder crops	26	470
4	Growing lucerne as a crop for fodder	1			
5	Testing six promising varieties of fodder corn	6			
6	Testing five promising varieties of turnips	5	Root crops	20	705
7	Testing five promising varieties of mangels	5			
8	Testing five promising varieties of carrots	5			
9	Testing six promising varieties of spring wheat	6	Grain crops	55	4,348
10	Testing six promising varieties of barley	6			
11	Testing six promising varieties of oats	6			
12	Testing five promising varieties of winter wheat	5			
				115	5,688

See report of Professor Shaw and Mr. Zavitz in Part VII. of this volume, and the report of the Experimental Union attached to this volume.

Live Stock.

We have not made any large addition to our live stock during the year. We purchased three Guernsey and a few grade cows in the early part of the summer ; and the Minister of Agriculture imported a few cattle and sheep, which we needed for the purpose of instruction. The imported animals are as follows :

Cattle.

Shorthorn bull "Manfred" (3415)—calved 2nd May, 1890, and bred by James Black, Old Meldrum, Scotland.

Sussex bull—under two years of age.
Guernsey bull—a little over one year old.
2 Guernsey cows—for the Dairy Department.
2 Ayrshire cows " " "

Sheep.

Rams, shearling—Shropshire, Oxford, Suffolk, Leicester, Lincoln and Cotswold.
Ram lamb—one Dorset Horn.
Ewes, shearling—4 Cotswold and 4 Lincoln.

Cows in Dairy Department.

I may add that we now have five distinct breeds of cows in our Dairy Department, viz., Jersey, Guernsey, Red Polled, Ayrshire and Holstein.

Farm Proper.

The work on the farm proper has gone on pretty much as usual; and the crops, excepting potatoes, have been fairly good. Professor Shaw has made some further efforts towards the eradication of a few remaining weeds, and has devoted a considerable amount of time to the work of grading the large lane which runs through the farm from from north-east to south-west.

Visitors.

Never before were there so many visitors at the College as in 1892. We had excursions nearly every day in the month of June, ranging from 300 to 2,500 each, and aggregating not less than 18,000 people—chiefly farmers and their families. We waited on these excusionists to the best of our ability; and, generally speaking, they seemed to be well pleased with what they saw and heard.

Students in Attendance.

About ten years ago we imposed a heavy tuition fee upon non-residents, and immediately thereafter the number in attendance was considerably reduced. Of late years there has been a gradual increase in our numbers, and at length we are compelled to refuse applicants for want of accommodation—nine or ten for the regular course, and between sixty and seventy for the Special Dairy Course to commence on the 1st February.

The number in attendance in 1892 was 159, the great majority of whom are Ontario farmers' sons. Forty-three counties and districts have been represented, and the largest representation has been from the Counties of Huron, Simcoe, Wellington, Brant, Lincoln, Oxford, Middlesex and York.

County Students.

Of those in attendance during the year, forty-two were nominated by county councils, and, as a consequence, were exempted from the payment of tuition fees. The counties represented were the following:

Brant, Bruce, Durham, Dufferin, Elgin, Frontenac, Glengarry, Grey, Grenville, Halton, Hastings, Haldimand, Huron, Kent, Lambton, Lanark, Leeds, Lincoln, Middlesex, Muskoka, Northumberland, Ontario, Oxford, Peel, Perth, Peterborough, Prince Edward, Parry Sound District, Renfrew, Russell, Simcoe, Stormont, Waterloo, Wellington, Wentworth, York.

Analysis of College Roll.

Counties, etc.	No. of students.
Addington	1
Brant	6
British Columbia	1
Bruce	3
Carleton	1
Dufferin	1
Dundas	2
Durham	3
Elgin	1
England	12
Frontenac	2
Germany	1
Glengarry	3
Grey	3
Haldimand	3
Hamilton	2
Halton	2
Hastings	2
Huron	10
India	1
Kent	1
Lambton	2
Lanark	2
Lincoln	5
Leeds	2
Lennox	1
Middlesex	5
Muskoka	1
Norfolk	1
Northumberland	1
North-West Territories	3
Nova Scotia	2
Ontario	4
Oxford	5
Parry Sound District	2
Poland	1
Peel	3
Perth	2
Peterborough	2
Prince Edward Island	3
Prince Edward County	3
Quebec	1
Rainy River District	1
Renfrew	4
Russell	1
Scotland	1
Simcoe	10
Spain	1
Stormont	1
Toronto	7
Waterloo	4
Welland	1
Wellington	7
Wentworth	3
Wisconsin, U.S.A	1
York	5
	159

For full list of students see Appendix I. at the end of this Report.

Religious Denominations.

Methodists	54
Presbyterians	49
Episcopalians	35
Baptists	7
Roman Catholics	5
Congregationalists	3
Friends	2
Disciples	2
Evangelical Reformed	1
Evangelical Association	1
Total	159

Age of Students.

5	16	years	
18	17	"	
22	18	"	
23	19	"	
20	20	"	
33	21	"	
17	22	"	
2	23	years	
6	24	"	
6	25	"	
1	26	"	
2	27	"	
3	28	"	
1	32	"	

Average age ..... 20 years.

Class-Room Work.

Our class-room work has gone on as usual during the past year. All the candidates for degrees were successful in passing the examinations held by the Senate of the University of Toronto; and a fair proportion of the first and second year students gained a respectable standing in our College examinations, but the number of failures is still much larger than it should be. (See class-lists in Appendix IV. at the end of this report.)

Examiners.

The third year examinations were conducted by the University of Toronto, and those of the first and second years by the Professors of the College and four other gentlemen, to whom we are much indebted:

T. C. L. Armstrong, M.A. ..... English Literature.
J. M. McEvoy, B.A ..... Political Economy.
C. A. Zavitz, B.S.A. ..... Agriculture and Live Stock.
H. B. Sharman, B.S.A. ..... Live Stock.

Bachelors of the Science of Agriculture.

Seven candidates for the degree of B.S.A. were examined in the month of May. These candidates were all successful, and received their degrees at the regular commencement exercises of the University of Toronto in June. The list is as follows:

Carlyle, W. L.	Chesterville, Dundas, Ont.
Gibson, D. Z.	Willow Grove, Haldimand, Ont.
Harrison, F. C.	Ronda, Spain.
Hutchinson, J. W.	Randolph, Wisconsin, U.S.A.
Marsh, G. F.	Thornbury, Grey, Ont.
Morgan, R. N.	Kerwood, Middlesex, Ont.
Newcomer, W. F.	Epping, Essex, England.

Recipients of Associate Diplomas.

Twenty-six young men, having completed our regular course of two years, received diplomas admitting them to the Status of Associates of the College. The diplomas were presented by the Hon. John Dryden, Minister of Agriculture, at our closing exercises, on the 30th of June, and the names of the recipients are as follows:

Aylesworth, D.	Bath, Lennox, Ont.
Beckett, H. L.	Hamilton, Wentworth, Ont.
Bell, L. G.	Q'Appelle Station, Assa.
Brown, B. C.	Barriefield, Frontenac, Ont.
Burns, J. A. S. (Valedictorian)	Halifax, Nova Scotia.
Carlaw, Walter	Warkworth, Northumberland, Ont.
Carpenter, F. C. S.	Rat Portage, Rainy River District, Ont.
Crealy, J. E	Strathroy, Middlesex, Ont.
Day, G. E.	Guelph, Wellington, Ont.
Dyer, W. D	Columbus, Ontario, Ont.
Eaton, L. W.	Dartmouth, Nova Scotia.
Gies, N	St. Jacobs, Waterloo, Ont.
Graham, W. R.	Belleville, Hastings, Ont.
Harcourt, R	St. Anns, Lincoln, Ont.
Harvey, W. H	Exeter, Huron, Ont.
Honsberger, J. D	Jordan, Lincoln, Ont.
Hurley, H. B	Belleville, Hastings, Ont.
Roper-Curzen, S.	Norbiton, Surrey, England.
Ruthven, W. A.	West Essa, Simcoe, Ont.
Shaw, R. S.	Ontario Agricultural College.
Silverthorn, C.	Summerville, Peel, Ont.
Soule, A. M	Niagara Falls South, Welland, Ont.
Story, H.	Picton, Prince Edward, Ont.
Tolton, J. E	Walkerton, Bruce, Ont.
Wiancko, A. T	Sparrow Lake, Muskoka, Ont.
Yuill, A. R.	Carleton Place, Lanark, Ont.

First-class Men.

The work in the College is divided into five departments, and all candidates who get an aggregate of 75 per cent. of the marks allotted to the subjects in any department, are ranked as first-class men in that department. We would like to have a larger number of such men, but we are determined that none shall be so ranked unless they really deserve it. The following list contains the names of those who gained a first-class rank in the different departments at the examinations in 1892, arranged alphabetically:

First Year.

1. *Atkinson, J.*, Seaforth, Huron, Ont.—in four departments: Agriculture, Natural Science, Veterinary Science and Mathematics.

2. *Ferguson, J. J.*, Smith's Falls, Leeds, Ont.—in five departments: Agriculture, Natural Science, Veterinary Science, English Literature and Mathematics

3. *McCallum, W.*, Guelph, Ont.—in three departments: Agriculture, Natural Science and English Literature.

4. *Spencer, J. B.*, Brooklin, Ontario County, Ont.—in one department: Agriculture.

5. *Walker, F.*, Norwich, Oxford, Ont.—in two departments: Agriculture and Mathematics.

Second Year.

1. *Beckett, H. L.*, Hamilton, Wentworth, Ont.—in two departments: Veterinary Science and Mathematics.

2. *Day, G. E.*, Guelph, Ont.—in four departments: Natural Science, Veterinary Science, English Literature and Mathematics.

3. *Dyer, W. D.*, Columbus, Ontario County, Ont.—in three departments: Agriculture, Natural Science and Mathematics.

4. *Harcourt, R.*, St. Anns, Lincoln, Ont.—in one department: Agriculture.

5. *Shaw, R. S.*, Guelph, Ont.—in five departments: Agriculture, Natural Science, Veterinary Science, English Literature and Mathematics.

6. *Soule, A. M.*, Niagara Falls South, Welland, Ont.—in three departments: Agriculture, Veterinary Science and English Literature.

Medalists.

Medals were given to the three students who ranked highest in general proficiency in the theory and practice of the second year. The competition was keen, as usual, with the following results:

Gold Medalists.—G. E. Day, Guelph, and R. S. Shaw, Guelph.

Stanley Silver Medalist.—H. L. Beckett, Hamilton, Wentworth, Ont.

Second Silver Medal.—A. M. Soule, Niagara Falls South, Welland, Ont.

First Year Prizemen.

Agriculture, Live Stock and Dairying.—1st, J. J. Ferguson, Smith's Falls, Leeds, Ont.

" " " 2nd, James Atkinson, Seaforth, Huron, Ont.

Natural Science.—1st, J. J. Ferguson; 2nd, James Atkinson.

Veterinary Science.—1st, J. J. Ferguson; 2nd, James Atkinson.

English Literature.—1st, J. J. Ferguson; 2nd, W. McCallum, Ontario Agricultural College.

Mathematics and Book-keeping.—1st, J. J. Ferguson; 2nd, James Atkinson.

General Proficiency.—1st, J. J. Ferguson; 2nd, J. Atkinson; 3rd, W. McCallum.

Second Year Prizemen.

Agriculture, Live Stock and Dairying.—1st, R. S. Shaw; 2nd, A. M. Soule

Natural Science.—1st, G. E. Day; 2nd, W. D. Dyer.

Veterinary Science.—1st, G. E. Day; 2nd, H. L. Beckett.

English Literature and Political Economy.—1st, G. E. Day; 2nd, A. M. Soule.

Mathematics and Book-keeping.—1st, G. E. Day; 2nd, H. L. Beckett.

General Proficiency.—1st, G. F. Day; 2nd, R. S. Shaw; 3rd, H. L. Beckett.

Special Prizes for Essay on Fat Stock Show.—1st, A. M. Soule; 2nd, R. Harcourt; 3rd, L. G. Bell.

The English Bible.—(Prize given by a friend.)—1st, Leonard G. Bell.

Closing Exercises.

Our closing exercises for the year took place on the 30th June. The weather was fine and the attendance very large. There were between 800 and 900 people present from Guelph and the surrounding district. His Honor, Lieutenant Governor G. A. Kirkpatrick, favored us with his presence, and delivered a short but interesting address to the students and visitors, some of whom had come a long distance to hear him. Hon. John Dryden, Minister of Agriculture, James Innes, M.P., D. Guthrie, Q.C., M P.P., Lieutenant-Colonel Macdonald, Sheriff McKim, a number of clergymen, and other leading men from the County of Wellington, were present and assisted in the presentation of medals, prizes and honor certificates.

Valedictory Address.

The second year man chosen to deliver the valedictory address for the year was J. A. S. Burns, of Halifax, Nova Scotia.

Changes in the Staff.

Two changes in our staff have taken place within the year. E. L. Hunt, B.A., who rendered us faithful service as Assistant President and Mathematical Master for nearly ten years, resigned his position on the 1st November last for the purpose of completing a course of study in Knox College, which he began some time since with a view to enter the ministry of the church to which he belongs. Mr. Hunt is a very active, earnest worker, and we wish him abundant success in the important calling which will hereafter engage his attention.

Mr. John McCrae, a fourth year undergraduate in the University of Toronto, was appointed to take Mr. Hunt's place. Mr. McCrae is an active young man of good parts, and I have no doubt he will prove a good disciplinarian and a successful teacher.

The other change referred to was in the Veterinary Department. F. C. Grenside, V.S., who has been our Professor of Veterinary Science for the last ten years, resigned his rofessorship a short time ago to take effect at the close of 1892. I need scarcely say that Dr. Grenside's services in the College and at Farmers' Institute meetings throughout the Province have been entirely satisfactory to all concerned. He has resigned, that he ma evote the whole of his time, without interruption, to the practice of his profession in Guelph.

J. Hugo Reed, V.S., of Guelph, a gold medallist at graduation and for some years a successful veterinarian in this neighborhood, has been appointed to succeed Dr. Grenside. Dr. Reed is at present travelling as the head of a Farmers' Institute deputation in the eastern part of the Province.

Farmers' Institutes.

Under the control of the Minister of Agriculture and in consultation with N. Awrey, M.P.P., representative of the Central Farmers' Institute, I have once more had the honor to arrange for the winter meetings of the Farmers' Institutes throughout the Province; and I am pleased to be able to report that this branch of our work is still increasing in magnitude and importance.

In making out the provincial programme, I have endeavored to arrange so as to have each deputation composed of a representative of the College, and two other good men qualified to discuss some of the many questions which are of interest and practical importance of the farming community

The following is the list of meetings to be held in January, 1893. This list embraces 119 meetings and covers nearly the whole Province, excepting East Simcoe, and the Districts of Muskoka, Parry Sound, and Algoma, which are to be arranged for at later date:

INSTITUTE MEETINGS IN JANUARY, 1893.

Division 1.

Professor Thomas Shaw, H. L. Hutt, B.S.A. and John Jackson.

Durham	S. Grey	Jan. 3rd,	10.30 a.m.
Kenilworth	E. Wellington	" 4th,	10.30 a.m.
Damascus	E. Wellington	" 5th,	10.30 a.m.
Harriston	W. Wellington	" 6th,	1.30 p.m.
Paisley	C. Bruce	" 7th,	1.30 p.m.
Port Elgin	N. Bruce	" 9th,	10.30 a.m.
Tara	N. Bruce	" 10th,	10.30 a.m.
Teeswater	S. Bruce	" 11th,	1.30 p.m.
Brussels	E. Huron	" 12th & 13th,	1.30 p.m. on 12th.
Holyrood	S. Bruce	" 14th,	10.30 a.m.
Kincardine	C. Bruce	" 16th,	10.30 a.m.
Dungannon	W. Huron	" 17th & 18th,	1.30 p.m. on 17th.
Hensall	S. Huron	" 19th,	10.30 a.m.
Zurich	S. Huron	" 20th,	10.30 a.m.
Park Hill	N. Middlesex	" 21st,	10.30 a.m.

Division 2.

Professor A. E. Shuttleworth, D. McCrae and W. L. Carlyle, B.S.A.

Drayton	W. Wellington	Jan. 3rd,	10.30 a.m.
Berlin	N. Waterloo	" 4th & 5th,	1.30 p.m. on 4th.
New Hamburg	S. Waterloo	" 6th & 7th,	1.30 p.m. on 6th.
Listowell	N. Perth	" 9th,	10.30 a.m.
Milverton	N. Perth	" 10th,	10.30 a.m.
Mitchel	S. Perth	" 11th & 12th,	1.30 p.m. on 11th.
Ilderton	E. Middlesex	" 13th & 14th,	1.30 p.m. on 13th.
Coldstream	N. Middlesex	" 16th,	10.30 a.m.
Wyoming	E. Lambton	" 17th & 18th,	10.30 a.m. on 17th.
Sombra	W. Lambton	" 19th,	10.30 a.m.
Brigden	W. Lambton	" 20th,	10.30 a.m.

Division 3.

Hon. Charles Drury, Thomas Mason and J. H. Broderick.

Appin	W. Middlesex	Jan. 3rd,	10.30 a.m.
Bothwell	E. Kent	" 4th,	10.30 a.m.
Thamesville	E. Kent	" 5th,	10.30 a.m.
Chatham Centre	W. Kent	" 6th,	10.30 a.m.
Maidstone	N. Essex	" 7th,	10.30 a.m.
Woodslee	N. Essex	" 9th,	10.30 a.m.
Kingsville	S. Essex	" 10th & 11th,	1.30 p.m. on 10th.
Tilbury Centre	W. Kent	" 12th,	10.30 a.m.
Bismarck Station	W. Elgin	" 13th,	10.30 a.m.
Shedden	W. Elgin	" 14th,	10.30 a.m.
Aylmer	E. Elgin	" 16th & 17th,	1.30 p.m. on 16th.
Delhi	N. Norfolk	" 18th,	10.30 a.m.
Port Rowan	S. Norfolk	" 19th,	1.30 p.m.
Vittoria	S. Norfolk	" 20th,	10.30 a.m.

Division 4.

W. J. Palmer, B.S.A., Wm. S. Fraser and A. McD. Allan.

Hamilton	S. Wentworth	Jan. 3rd, 10.30 a.m.
Hall's Corners (Binbrook P.O.)	S. Wentworth	" 4th, 10.30 a.m.
Campden	Lincoln	" 5th & 6th, 1.30 p.m. on 5th.
Niagara Falls South	Welland	" 7th, 10 30 a.m.
Welland	Welland	" 9th, 10.30 a.m.
Pelham Town Hall	Monck	" 10th, 10.30 a.m.
Cayuga	Haldimand	" 11th & 12th, 1.30 p.m. on 11th.
Canborough	Monck	" 13th, 10.30 a.m.
Waterford	N. Norfolk	" 14th, 10.30 a.m.
Norwich	S. Oxford	" 16th & 17th, 1.30 p.m, on 16th.
Mount Pleasant	S. Brant	" 18th & 19th, 1.30 p.m. on 18th.
St. George	N. Brant	" 20th & 21st, 1.30 p.m. on 20th.

Division 5

John I. Hobson, Samuel Hunter and G. C. Caston.

Embro	N. Oxford	Jan. 3rd, 10.30 a.m.
Drumbo	N. Oxford	" 4th, 10.30 a.m.
Freelton	N. Wentworth	" 5th, 10.30 a.m.
Nassagaweya	Halton	" 6th, 1.30 p.m.
Weston	W. York	" 7th, 10.30 a.m.
Woodbridge	W. York	" 9th, 10.30 a.m.
Owen Sound	N. Grey	" 10th & 11th, 1.30 p.m. on 10th.
Maxwell	C. Grey	" 12th, 10.30 a.m.
Markdale	C. Grey	" 13th, 10.30 a.m.
Shelburne	Dufferin	" 14th, 10.30 a.m.
Orangeville	Dufferin	" 16th, 10.30 a.m.
Erin	C. Wellington	" 17th, 10.30 a.m.
Fergus	C. Wellington	" 18th, 10.30 a.m.
Guelph	S. Wellington	" 19th, 10.30 a.m.
Brampton	Peel	" 20th & 21st, 1.30 p.m. on 20th.

Division 6

John McMillan, M.P., F. B. Linfield, B.S.A. and D. W. Beadle.

Burlington	Halton	Jan. 3rd, 10.30 a.m.
Bond Head	S Simcoe	" 4th & 5th, 1.30 p.m. on 4th.
Collingwood	W. Simcoe	" 6th & 7th, 1.30 p.m. on 6th.
Elmvale and Wyevale	C. Simcoe	" 9th, 1.30 p.m. at Elmvale.
Minesing	C. Simcoe	" 10th, 10.30 a.m.
Newmarket	N. York	" 11th & 12th, 1.30 p.m. on 11th.
Agincourt	E. York	" 13th & 14th, 1.30 p.m. on 13th.
Uxbridge	N. Ontario	" 16th, 10.40 a.m.
Cannington	N. Ontario	" 17th, 10.30 a.m.
Woodville	W. Victoria	" 18th, 10.30 a.m.
Beaverton	N. Ontario	" 19th, 10.30 a.m.
Oshawa	S. Ontario	" 20th, 10.30 a.m.
Pickering	S. Ontario	" 21st 10.30 a.m.

Division 7.

H. B. Sharman, B.S.A., D. E. Smith, B.A. and R. F. Holtermann.

Lindsay	W. Victoria	Jan.	3rd, 10.30 a.m.
Bobcaygeon	E. Victoria	"	4th & 5th, 1.30 p.m. on 4th.
Lakefield	W. Peterborough	"	6th, 10.30 a.m.
Peterborough	W. Peterborough	"	7th, 10.30 a.m.
Warkworth	E. Northumberland	"	9th & 10th, 1.30 p.m. on 9th.
Grafton	W. Northumberland	"	11th, 10.30 a.m.
Picton	Prince Edward	"	12th, 10.30 a.m.
Wellington	Prince Edward	"	13th, 10.30 a.m.
Napanee	Lennox	"	14th, 10.30 a.m.
Bath	Lennox	"	16th, 10.30 a.m.
Cannifton	E. Hastings	"	17th, 10.30 a.m.
Baltimore	W. Northumberland	"	18th, 10.30 a.m.
Orono	W. Durham	"	19th, 10.30 a.m.
Bullock's Corners	N. Wentworth	"	20th, 10.30 a.m.

Division 8.

Professor J. Hugo Reed, V.S., T. G. Raynor, B.S.A. and A. H. Pettit.

Blackstock	W. Durham	Jan.	3rd, 10.30 a.m.
Tweed	E. Hastings	"	4th & 5th, 1.30 p.m. on 4th.
Sharbot Lake	Frontenac	"	6th & 7th, 1.30 p.m. on 6th.
Perth	S. Lanark	"	9th, 10.30 a.m.
Smith's Falls	S. Lanark	"	10th, 10.30 a.m.
Almonte	N. Lanark	"	11th, 10.30 a.m.
Pakenham	N. Lanark	"	12th, 10.30 a.m.
Renfrew	S. Renfrew	"	13th, 10.30 a.m.
Eganville	S. Renfrew	"	16th, 10.30 a.m.
Richmond	Carleton	"	17th & 18th, 1.30 p.m. on 17th.
Winchester	Dundas	"	19th, 10.30 a.m.
Avonmore	Stormont	"	20th, 10.30 a.m.

Division 9.

Professor J. Hoyes Panton, Joseph Yuill and Edward Jeffs.

Spencerville	S. Grenville	Jan.	3rd, 10.30 a.m.
Oxford Mills	N. Grenville	"	4th & 5th, 1.30 p.m. on 4th.
Metcalfe	Russell	"	6th & 7th, 1.30 p.m. on 6th.
Vankleek Hill	Prescott	"	9th & 10th, 1.30 p.m. on 9th.
North Lancaster	Glengarry	"	11th, 10.30 a.m.
Martintown	Glengarry	"	12th, 10.30 a.m.
Cornwall	Cornwall	"	13th, 10.30 a.m.
Morrisburg	Dundas	"	14th, 10.30 a.m.
New Dublin	Brockville	"	16th, 10.30 a.m.
Athens	Brockville	"	17th, 10.30 a.m.
Lansdowne	S. Leeds	"	18th, 10.30 a.m.
Delta	N. Leeds	"	19th, 10.30 a.m.
Centreville	Addington	"	20th & 21st, 1.30 p.m. on 20th.

FINANCIAL STATEMENT.

I.—College Expenditure.

(a) College Maintenance.

1. *Salaries and Wages*		$15,642 97
2. *Food*—		
Meat, fish and fowl		3,201 38
Bread and biscuit		618 89
Groceries, butter and fruit		4,226 92
3. *Household Expenses*—		
Laundry, soap, and cleaning		388 69
Women servants' wages—cooks, laundress, housemaids, etc.		1,716 17
4. *Business Department*—		
Advertising, printing, postage and stationery		966 65
5. *Miscellaneous*—		
Laboratory—chemicals, apparatus, etc.		445 81
Library—books, papers and periodicals		304 76
Medals		115 61
Unenumerated		749 43
		$28,327 28

(b) Maintenance and Repairs of Government Buildings.

Furniture and furnishings	$757 33	
Repairs and alterations	893 97	
Fuel	3,477 94	
Light	897 60	
Water	650 00	
Sewage disposal	148 04	
		$6,824 88
		$35,152 16

College Revenue.

Tuition fees	$1,818 66	
Laboratory fees for gas and chemicals	220 00	
Fees for supplemental examinations	17 00	
Balances paid for board, after deducting allowances for work on farm, etc.	4,847 24	
Fines, breakages, etc.	31 99	
Sales of bones	7 80	
Sale of ice	15 50	
Refund from public works	3 00	
		6,961 19
Net cash expenditure of College		$28,190 97

The net sum voted by the Legislature for the College and the maintenance and repairs of Government buildings (see Estimates for 1892, pp. 35 and 40) was $30,195. Hence the unexpended balance for the year is $2,004.03.

II.—Farm.

(*a*) *Farm Proper.*

1. *Permanent Improvements*—		
Underdraining, building new kitchen to carpenter's house, enlarging silo and wagon shed, grading and fencing lane, etc		$2,729 22
2. *Farm Maintenance*—		
Salaries and wages	$4,555 65	
Live stock imported from Great Britain	2,968 31	
Live stock—cows, steers, lambs, etc	2,536 81	
Maintenance of stock	4,556 25	
Seeds	185 52	
Manures	2 75	
Binding twine	55 90	
Repairs and alterations	569 87	
Furniture and furnishings	281 24	
Tools and implements	343 53	
Advertising, printing, postage and stationery	571 84	
Fuel and light	311 02	
Contingencies	396 90	
Hire of horse labor	10 00	
		$17,345 59
		$20,074 81

Farm Revenue.

Sale of cattle	$2,629 31	
" lambs	4,950 38	
" pigs	767 69	
" wheat	196 64	
" oats	130 25	
" rye	20 75	
" barley	21 50	
" peas	1 50	
" hides and pelts	18 65	
" wool	183 89	
" milk and cream	108 71	
" potatoes	1 20	
" old iron	19 65	
Service of animals	157 00	
Keep of animals	37 00	
Notes paid for stock sold by public auction, 1891	906 74	
Refund of registration fees	5 00	
Sale of sundries	8 00	
		$10,163 86
Net cash expenditure of farm proper		$9,910 95

(*b*) *Experiments.*

Salaries and wages—	
Assistant Superintendent of Experiments	$1,199 98
Special assistant	118 73
Experimental feeder	395 86
Labor	2,083 15
	$3,797 73

Seeds	362 00
Manures and special fertilizers	95 60
Team of horses and stock for feeding	281 50
Furniture, furnishings and repairs	362 98
Printing, postage and stationery	171 37
Implements	246 51
Feed and fodder	7 85
Exhibitions	252 53
Contingencies	8 75
	$5,586 82

III.—Experimental Dairy.

Salaries and wages—	
Assistant for experimental work	$530 79
Laborers for milking and feeding stock, etc.	407 38
Temporary assistance	126 80
	$1,064 97
Cattle imported from Great Britain	478 00
Purchase of cows and pigs	377 55
Feed for cows and pigs	676 63
Furniture, furnishings and repairs	511 00
Laboratory expenses, gas, chemicals, etc.	18 27
Advertising, printing, postage and stationery	146 61
Fuel	110 06
Dairy appliances for fitting up new butter and cheese rooms—extractor, accumulator, separator, curd-mills, milk vats, etc	991 30
Expenses *re* travelling dairy	6,301 26
Contingencies	96 88
	$10,772 53

Dairy Revenue.

Cash sales of cattle	$90 00	
" pigs	216 03	
" butter	495 96	
" milk	79 54	
" butter tubs	22 50	
" creamery plant	200 00	
		$1,104 03
Net expenditure of Experimental and Travelling Dairies		$9,668 50

IV.—Garden, Lawn, etc.

Salaries and wages—	
Foreman	$700 00
Gardener	480 00
Assistant Gardener	317 44
"	300 00
Teamster	324 96
Laborers	1,338 14
	$3,460 54

Manure		90 60
Trees, seeds, bulbs, and plants		207 68
Furniture, furnishings and repairs—		
Tools, implements, flower-pots, etc		380 46
Fuel and light		541 40
Contingencies		34 02
		$4,714 70

Less Garden Revenue.

Sale of vegetables	$47 50	
" old greenhouse frame	30 00	
Refund from Public Works	3 60	
		$81 10
Net expenditure of the Horticultural Department		$4,633 60

V.—Mechanical Department.

Salary of foreman	$700 00
Extra carpenter for erection of buildings	430 00
Lumber, nails, oil, paint, etc	35 66
Tools, etc	79 40
Fuel and light	25 80
Expenditure of Mechanical Department	$1,270 86

Total Net Expenditure for Maintenance in all Departments in 1891.

College	$28,190 97
Farm proper	9,910 95
Farm experiments	5,586 82
Experimental and travelling dairies	9,668 50
Garden, lawn, etc	4,633 60
Mechanical Department	1,270 86
	$59,261 70

VI.—College in Account with Farm and Garden.

(a) *With Farm.*

To 252 bags potatoes, 50c.	$126 00
" 66 " " 70c.	46 20
" 4,705 gallons milk, 12½c.	588 13
" feed for College horse (without attendance)	75 00
" " Bursar's " " "	75 00
" putting in ice for College	26 25
" cartage for College, offset by kitchen refuse used by farm	
" hauling sludge from sewage tanks, offset by manurial value of sludge	
	$936 58

(b) *With Garden.*

To fruit and vegetables supplied from time to time	$739 02
	$1,675 60
By amount paid by College for student labor on farm and garden (mostly on farm) $3,150 47	
" half of farm superintendent's salary 1,000 00	
	4,150 47
By balance to credit of College	$2,474 87

VII.—Farm in Account with Experimental Dairy.

To putting in ice for dairy	$18 00
" hauling stone	12 00
" sowing and cultivating corn	6 00
" mowing field No. 10	3 00
" 100 tons ensilage, $1.25	125 00
" 1,300 bushels turnips, 7c.	91 00
" service of animals	41 00
" 1 mower knife broken	4 50
	$300 50

Buildings still needed.

We have, as already stated, made several important additions to our buildings during the past year, and our equipment is now quite creditable; but we require four or five more to enable us to do fully and satisfactorily the work we have on hand. Those most needed are as follows:

(1) A double house for the assistant and the cattleman in the dairy department.

(2) An experimental building.

(3) A poultry building.

(4) Houses for the Professors of Chemistry, Natural History, and Dairying.

Hoping that you may find it possible to erect some of these before the end of the year 1893.

I have the honor to be, sir,

Your obedient servant,

JAMES MILLS,
President.

PART II.

REPORT OF THE

PROFESSOR OF NATURAL HISTORY AND GEOLOGY

To the President of the Ontario Agricultural College:

In presenting to you a report referring to the Department of Natural History, I do so this year with great pleasure. Never in the history of the College has the equipment of this department presented such a favorable appearance as now. During the past year the botanical laboratory has been completed and we have at last after years of patience, reached the dawn of brighter days. The class-room, seated for 94 students, is perfect in its acoustic properties. The wall in front forms a most admirable screen for projecting views upon by means of the stereopticon which we now use with the limelight. By a simple arrangement it is readily adapted for the display of diagrams. At a time when so much stress is laid upon technical education too much cannot be done to illustrate every lecture with diagrams either upon canvas or by means of views projected upon a screen. For some time I have been working in this direction and have succeeded in getting many slides prepared to illustrate the teachings of science as it bears upon agriculture. We are now able to procure excellent views of beneficial and injurious insects; injurious parasitic plants such as blights, mildews, rusts, etc., and many subjects in both zoology and geology. The arrangements for the study of microscopy in the adjoining room are exceedingly well adapted to practical work. We can now give each student a table and outfit. Everything in connection with this subject of study is so planned that the tendency to confusion is reduced to a minimum.

The private room is also very suitable for work and study. The small room on the north side will be very convenient for keeping plants for further study, and also for carrying on experiments from time to time. Seldom are four rooms so well arranged for experiment, teaching, work and study as those connected with the botanical department. Our three cabinets containing collections of injurious and beneficial insects, minerals and plants, are most valuable in the study of economic entomology, geology and botany. I am certainly much indebted to you for securing the apparatus recommended in my last report, and hope to make good use of it by fostering in the minds of students a love for the study of subjects connected with agricultural science. We have made so many strides during the past few years that great changes have been made in the curriculum of studies, and consequently a marked increase in the work and responsibility of each department has resulted.

In former years there was no annual report to write, no bulletins to prepare, no farmers' institutes to attend, no third year to teach and scarcely any inquiries to answer. To-day these five additional duties demand our attention. As for my department, you are aware that much of the teaching is of such a nature that diagrams and apparatus are constantly in use and require time to arrange, etc. This will increase because there is a

greater demand for technical education, and besides it makes the work far more attractive and impressive to the student when we appeal to his eyes as well as ears. This of course means much of the lecturer's time spent in preparation. Further, the establishment of experimental stations in the United States has produced a flood of literature bearing upon problems in agricultural science. Consequently the professor of a department requires to spend much time in examining the results of the investigations bearing upon subjects of which he is the teacher. With such a demand upon my time, I believe we have reached a point in progress where the establishment of a fellowship in connection with the Department of Natural History might be reasonably advocated. This fellowship could be awarded to one of our best students in the third year who desired to continue at the College for a longer period with a view to perfecting himself still more in subjects of study and at the same time act as assistant to the professor of the department.

My duties hitherto have been as follows:

1. To deliver a course of lectures on Hygiene, Zoology, Structural Botany and Geology to the students of the first year.

2. A course on Theoretical Horticulture, Economic Entomology and Economic Botany to the second year.

3. A course on Physiological Botany, Economic and Systematic Botany, and Biology to the third year. Also, to superintend practical work in Microscopy two afternoons of each week until May.

4. As librarian, to superintend the library and reading-room.

5. As curator of the museum, to oversee it.

6. To arrange for the taking of meteorological observations, and to report annually upon them.

The taking and recording of observations relating to the weather belongs properly to the Experimental Department, and to such should be transferred; especially now as I reside in the city, and not at the College, as formerly when it was placed in my charge.

In the museum so many specimens have been added of late years that there is a great deal of labelling, etc., which cannot be done without assistance. The library, too, has become a great source of work, and much could be done there in indexing, etc., which, at present, cannot be undertaken. Our students are showing much more interest in reading now than in former years; many more books are sought after, and a greater desire is manifested for consulting works in the library. At present it is open for giving out books a short time in the morning, but this is not sufficient. Until I removed to the present botanical laboratory my office was in the library, consequently any one of the staff coming to the library could gain access; but now, in my absence, such cannot be. The result is, that much inconvenience arises to members of the staff who desire to consult books from time to time. In fact we should have a librarian there all the time, and use the adjoining room as a reading room; but, probably, we are not in a position yet to ask so much. Should we get an assistant appointed to the Department of Natural History, much improvement would be effected in the museum and the use of the library.

Having placed this suggestion before you, I feel assured you will give it that consideration its importance and practicability demand.

1. Museum.

The following persons have donated specimens to the museum this year:

G. C. Peacock, Mt. Salem: 8 species of weed seeds. E. Newton, Esq., Guelph: fossils from the Utica slate formation, Collingwood. W. N. Howell, Grey: a peculiar plant growth. F. DeHart, Whitby: a bottle of pickles put up in '79, also a flint arrowhead. Beverley Ruffin, Danville, Va.: specimens of tobacco. David Carstairs, Bowmantan: larvæ of ground beetles.

A number of weed seeds have been gathered, and arranged at the side of plants in our collection of weeds upon the walls. Our museum is yearly becoming more useful as an adjunct to the class-room. The specimens desired are those of a practical nature, rather than suited for the ordinary observer, who looks only for strange things. At present I am negotiating for some botanical specimens which will prove of great practical value to the student in Economic Botany.

2. Library.

Several useful volumes have been added during the year, and our list is gradually embracing a valuable collection of books for students in agricultural science. Far more books are being read now than in former years, and students are learning more than ever the sources from which knowledge may be obtained regarding the latest discoveries in agricultural science.

The chief complaint is that our course is not long enough to give an opportunity to make more use of the library. One hundred and thirty volumes have been added during the year; these may be grouped as follows:

Reports, chiefly agricultural	63
Natural History	4
Veterinary	1
Agriculture	6
Chemistry	1
Literature	20
Botany	3
History	3
General Science	2
Parliamentary Reports	10
Travels	5
Biography	7
Entomology	2
Horticulture	1
Miscellaneous	2
	130

3. Reading Room.

This is one of the most commodious and pleasant rooms in the College, and is becoming yearly more used for the purpose it was intended. It is well furnished for reading and study; excellent tables and chairs, and convenient reading desks, upon which are found the best agricultural journals published, a list of which is given below.

The following is a list of papers, journals and magazines which come to the College, and are for the use of the students in attendance:

(a) *Sent free by the Publishers.*

Name.	Where published.
1. Journal of Commerce	Montreal.
2. Canadian Baptist	Toronto.
3. Christian Guardian	"
4. Canada Presbyterian	"
5. Monthly Weather Review	"
6. Presbyterian Review	"
7. Sheep Breeder and Wool Grower	Chicago.
8. Manitoba Weekly Free Press	Winnipeg.
9. Canadian Horticulturist	Grimsby.
10. Canadian Entomologist	London, Ont.

	Name.	Where published.
11.	Bee Journal	Beeton.
12.	North York Reformer	Newmarket.
13.	Acton Free Press	Acton.
14.	Ontario Evangelist	Erin, Ont.
15.	Evangelical Churchman	Toronto.
16.	Farmers' Review	Chicago.
17.	Canadian Independent	Toronto.
18.	Rural Home Journal	Kentucky.
19.	Canadian Churchman	Toronto.
20.	" Independent	"
21.	" Evangelist	"

(b) *Furnished by the College.*

1.	Daily Globe	Toronto.
2.	" Mail	"
3.	" Empire	"
4.	" Mercury	Guelph.
5.	" Herald	"
6.	Rural Canadian	Toronto.
7.	Grip	"
8.	Poultry Review	"
9.	Farmers' Advocate	London, Ont.
10.	Canadian Stock Raisers' Journal	Toronto.
11.	Nor'-West Farmer	Winnipeg.
12.	Breeders' Gazette	Chicago.
13.	North British Agriculturist	Edinburgh, Scotland.
14.	American Garden	Greenfield, Mass.
15.	Cultivator and Country Gentleman	Albany, N.Y.
16.	Scientific American	New York.
17.	Live Stock Journal	England.
18.	American Dairyman	New York.
19.	Botanical Gazette	Crawfordsville, Ind.
20.	Agricultural Science	Geneva, N.Y.
21.	Literary Digest	Boston.
22.	Entomological News	Philadelphia.
23.	Canadian Agricultural and Home Magazine	Peterborough.
24.	Hoard's Dairyman	Ft. Atkinson, Wis.
25.	Maritime Agriculturist	New Brunswick.

The following bulletins have been issued from this Department during 1892 :

FUNGICIDES AND INSECTICIDES.

Of the numerous experiments that are being carried on at Experiment Stations in Canada and the United States none have afforded more definite results than those conducted for the purpose of ascertaining what compounds may be used successfully against such parasitic plants as blights, mildews, rusts and smuts, and against the insects injurious to vegetation.

Although results of these investigations are printed in agricultural and horticultural journals from time to time yet many Canadian farmers are not fully informed in regard to them. During a late trip in connection with Farmers' Institutes I was surprised that so few had as yet learned anything from this field of investigation.

With a view to reach at least the members of Institutes in Ontario I have put into this bulletin some practical knowledge upon the results of researches in reference to the use of fungicides and insecticides, and hope it will prove handy for reference when information regarding these is required.

Fungicides.

Fungicides may be defined as chemical compounds or mixtures used for the purpose of destroying such injurious forms of plant life as live upon other plants by absorbing their juices to such an extent as to affect their vitality. Examples are seen in the *rusts, smuts, mildews and blights.*

It is but a comparatively short time since the life history of these obscure forms of plant life has been made out; but during late years wonderful strides have been made in this department of biology, and we are now in possession of knowledge that enables us to hold in check their destructive effects by the application of so-called fungicides; among which some of the most important are:

Bordeaux Mixture. (1) This consists of copper sulphate, lime and water in the following proportions: 6 lbs. of copper sulphate, 4 lbs. lime, 22 gals. water. This may be prepared by dissolving the copper compound in 16 gals. water; slake the lime in 6 gals. water, and when the latter is cooled pour it slowly into the copper solution and mix thoroughly. Some use less water for dissolving the first. This solution sprayed has been successful against downy mildew of the grape and potato blight.

(2) A modified form 4 lbs. copper sulphate, 4 lbs. lime and 50 gals. water has been beneficial upon raspberries affected with anthracnose.

(3) 6 lbs. copper sulphate, 4 lbs. lime, 50 gals. water.

Eau Celeste. This consists of copper sulphate, ammonia (commercial) and water, 2 lb. copper sulphate, 2 pints ammonia and 50 gals. water. Dissolve the copper sulphate in about 2 gals. hot water, as soon as cool add the 2 pints ammonia and dilute to 50 gals.

A modified form has given better results, viz: 2 lbs. copper sulphate dissolved in 2 gals. water, 2½ lbs. sodium carbonate (washing soda) dissolved in another vessel. Mix these, and when chemical action has ceased add 1½ pints of ammonia and dilute to 22 gals. Some dilute even to 30 with good results.

This has been found good against downy mildew of grapes, black rot of grape, anthracnose, blight of potato, rot of the tomato, gooseberry mildew, and scab of apple when sprayed upon the affected plants.

Eau Grison (Grison liquid). This consists of sulphur, lime and water. Boil 3 lbs sulphur and 3 lbs. lime in 6 gals. water until reduced to 2 gals. When settled pour off the clear liquid; this may be bottled and when used dilute with 100 parts water. This is used to destroy downy mildew and powdery mildew of the grape and the mildew of the gooseberry.

Copper Sulphate. 1 lb. in 24 gals. water used to destroy smut on seed grain. Soak the seed in this for from 12 to 16 hours; then dip it into lime water for five minutes. The last step is not absolutely necessary, but is an improvement. 1 lb. in 25 gals. water is sprayed in early spring on vines to kill the spores of fungi.

Ammoniacal solution of copper carbonate. Copper carbonate, ammonia and water. Dissolve 4 oz. copper carbonate in 2 quarts ammonia, and when about to use dilute to 30 gals. Used to destroy grape mildew and apple scab. In the latter disease it has been very successful.

Potassium Sulphide. 1 oz. potassium sulphide to 2 gals. water destroys gooseberry mildew and strawberry blight—so-called "Sunburn."

Sodium Hyposulphite. 1 lb. to 10 gals. water used against apple scab, but not so successful as Eau Celeste and the ammoniacal solution of copper carbonate.

Galloway's Mixture No 5. This is a mixture of equal parts, ammoniated copper sulphate and ammonium carbonate used at the rate of 8-12 ozs. to 25 gals. of water reported good against the apple "spot."

Treatment of some Common Forms of Fungi.

"*Spot*" *on the Apple*—No. 1. 1st, spray before blossoms open with Bordeaux mixture, No. 2. 2nd, 3rd, 4th, same mixture with 4 oz. Paris green to the barrel. This will act as an insecticide. The second application is made when the fruit is well formed ; the others at intervals of two weeks.

2. Ammoniacal solution of copper carbonate. 1st, before blossoming. 2nd, apples about size of peas ; 3rd, two weeks later.

Brown rot on cherry, plum and peach. Same as for apple "spot."

Pear leaf blight. Apply ammoniacal copper carbonate. 1st, as soon as leaves begin to open, 2nd, 3rd and 4th at intervals of two weeks.

Strawberry blight. Ammoniacal copper carbonate or Bordeaux mixture every two weeks during July and August.

Black rot on grapes. Ammoniacal solution copper carbonate, 5-7 times ; commence early in May every two weeks.

Downy mildew on grapes. Spray with Eau Celeste. 1st, before blossom (10 days.) 2nd, when berries are well set. 3rd, three weeks later.

INSECTICIDES.

Compounds or mixtures used to destroy insects injurious to vegetation.

Paris green (arsenite of copper containing 50 to 60 per cent. of arsenic). Applied dry or in solution. In the dry form best mixed with 50 to 100 parts plaster, wood-ashes, flour or air-slacked lime and dusted upon the affected plants. The wet form is usually used in the proportion of 1 lb. Paris green to 200 gals. of water, but if the foliage is tender 250 to 300 gals. water (applies to application upon the plum). As this green powder does not dissolve it requires to be kept thoroughly mixed. It is an excellent insecticide against potato bug, plum curculio, canker worm, tent-caterpillar, grape-vine beetle and codling moth. It can be used successfully in nearly all cases of leaf-eating insects.

London purple. An arsenite of lime obtained as a by-product in manufacturing dyes ; is largely used instead of Paris green ; but being more soluble in water it is likely to injure the foliage, and besides its composition varies considerably so that when used it is not likely give as uniform results as Paris green.

In spraying for codling moth it is usual to spray after the blossoms fall, when the apples are about the size of peas and before they have turned downwards on the stem, and a second time about ten days after. For plum curculio, as soon as the fruit is formed followed by two or three applications with an interval of ten days between. In this case the solution is weaker than that used upon the apple, 1 lb. in 250 to 300 gals. of water.

Kerosene emulsion. A mixture of coal oil and water. There are three mixtures of this kind that are used to a considerable extent :

(*a*) Riley-Hubbard emulsion. ½ lb. hard soap in 1 gal. rain water, boil till dissolved, then add 2 gals coal oil and mix thoroughly for about five minutes. When properly mixed it will adhere to glass without oiliness. In using dilute with 9 parts water (soft).

(*b*) Cook's emulsion (soft soap). 1 quart soft soap, 2 quarts boiling water. While hot add 1 pint of coal oil. Mix thoroughly. In using dilute with equal amount of water. May use hard or soft water.

(*c*) Cook's emulsion (hard soap). ¼ lb. hard soap, 2 quarts water and 1 pint coal oil, and thoroughly mix while hot. In using dilute with twice the amount of water (hard or soft).

These emulsions are very excellent against plant lice, scale insects, chinch bug, cabbage-worm and even rose-beetle.

Hellebore. Obtained from the powdered roots of a plant (Veratrum album). May be applied dry or as a liquid. 1 oz. to 3 gals. water. Excellent against currant worm and cherry slug.

Pyrethrum. Made from the powdered flowers of the genus pyrethrum, a plant of the sunflower family. It should be fresh, and hence should be kept in closed vessels. Used in dry form, 1 part pyrethrum, 5 to 8 parts flour; or liquid 1 oz. in 3 gals. water. A good remedy for cabbage-worm.

A combined insecticide and fungicide. 4 oz. Paris green with Bordeaux mixture No. 2, good against potato beetle and blight, codling, moth and "spot" of apple.

Carbolic Acid Emulsion. 1 part carbolic acid to 5 or 7 parts of a solution consisting of 1 quart soft soap or 1 lb. hard in 2 gals. water. This applied to affected trees destroys bark-lice and the borers. It should be well rubbed upon the parts attacked.

Carbolized Plaster. A mixture of carbolic acid and land plaster, 1 pint of the former and 50 lb. of the latter. A remedy against flea beetles.

Tobacco. The refuse from cigar manufactories answers the purpose. A strong solution added to one gallon water destroys plant lice and flea beetles. About 1 lb. of tobacco to 2 gallons.

Alkaline Wash. (1) A strong solution of washing soda mixed with soft soap until about as thick as paint. Applied to the trunk of trees destroys the borers, and gives a healthy vigorous tone to the tree. (2) 1 qt. soft soap or $\frac{1}{4}$ lb. hard soap in two quarts of water; add 1 part of carbolic acid to 7 of this.*

Application of Fungicides and Insecticides.

The foregoing compounds and mixtures are usually applied by means of spraying machines, many of which are now advertised and information concerning them may be readily obtained from seedsmen or others concerned in their sale. As such are readily accessible to farmers and gardeners it is unnecessary to give the names of manufacturers.

The following list of prices will give the readers an idea of the approximate cost incurred by the use of certain compounds in making up mixtures. Price per lb.:

Ammonia, 25c.; copper carbonate, 60c.; Paris green, 30c.; London purple, 15c.; pyrethrum, 40c.; copper sulphate, 12c.; hellebore, 25c.; sodium carbonate, 5c.

Precautions in Spraying, etc..

1. Keep poisonous substances labelled and out of the way of children.
2. Do not continue to spray so far into the season as to affect the fruit.
3. In making emulsions remember the inflammable nature of coal oil.
4. Never spray trees in bloom.
5. Try mixtures on a small scale if you have any doubts regarding their effect upon the foliage.
6. Be careful and thorough in your work.

Much has been said of late regarding the danger incurred by eating fruit from trees and vines which had been sprayed with Paris green, but careful chemical analysis shows there is no ground for such an alarm. In the case of some suspected apples it was found that eight tons would require to be eaten before a dose of poison would be taken.

* A good remedy against *Bark-lice* is to rub affected trees with alkaline solution No. 2 in early spring, and spray in June with kerosene emulsion.

Bees in Relation to Fruit.

An Act passed by the Ontario Legislature last session, referring to the prevention of spraying fruit trees while in bloom, has led to considerable discussion among fruit-growers and bee-keepers. The former feel that they should be permitted to spray whenever they desire, claiming that bees are not killed from visiting sprayed trees in search of nectar, and that this cry of alarm raised by bee-keepers is unfounded. Further, many are under the impression that bees injure ripe fruit, and that it is questionable whether bees are as useful in the fertilization of flowers as is claimed for them by their admirers.

The bee-keepers, on the other hand, maintain that bees are important in the fertilization of flowers, and thus become necessary to fruit production; that they do not injure fruit, and that they are killed where trees are sprayed while in bloom. They go so far as to say that honey is affected where bees have been poisoned by Paris green.

In this somewhat confused state of affairs a bulletin bearing upon bees in relation to fruit should be of interest and practical benefit when the following Act (*passed April, 1892*) is about to be enforced:

1. No person in spraying or sprinkling fruit trees during the period within which such trees are in full bloom shall use or cause to be used any mixture containing Paris green or any other poisonous substance injurious to bees.

2. Any person contravening the provisions of this Act shall, on summary conviction thereof before a justice of the peace, be subject to a penalty of not less than $1 or more than $5, with or without costs of prosecution, and in case of a fine or a fine and costs being awarded, and of the same not being upon conviction forthwith paid, the justice may commit the offender to the common gaol, there to be imprisoned for any term not exceeding thirty days unless the fine and costs are sooner paid.

3. This Act shall not come into force until the first day of January, 1893.

Bees in Relation to Fertilization.

During the process of fertilization the contents of the pollen grains become mingled with those of the ovules, after which the latter develop into seeds. This takes place somewhat as follows: The dust-like substance (pollen) on the ends of the stamens falls upon the top of the pistil. The outer coat of the pollen grain bursts, and the inner pushes out in the form of a tube, which forces its way from the top of the pistil down through it until it reaches the ovary (the lower and enlarged part of the pistil) where the ovules are located. In the meantime a minute structure (germinal vesicle) has formed in the ovule. This point is reached by the pollen tube, an interchange of elements takes place, the ovule is fertilized, and at once changes begin which end in the complete development of a seed.

The question naturally arises: How do the pollen grains get to the pistil? This effected, fertilization will in all likelihood take place.

Observation shows that this may be done in several ways.

1. *By the wind.* Where this is the usual way we find the plants are rich in pollen, have no nectar, grow crowded together, in some cases bloom before the leaves appear, and are seldom attractive in appearance. The grasses, willows, and some maples afford examples of plants largely dependent upon the wind for the transport of the pollen to the pistil.

2. *By artificial means.* Man can effect the same result by simply taking the pollen and placing it upon the pistil. This has enabled him to cross-breed and hybridize to such an extent that he has developed innumerable varieties of plants of great economic value, as is exemplified in our beautiful flowers and luscious fruits.

3. *By birds*, which to some extent aid in carrying pollen from plant to plant, especially such as the humming birds.

4. *By insects.* This, probably, is by far the most common method in nature, and may be viewed as the chief use of insects.

Plants fertilized by insects present an attractive appearance, are rich in perfume, and above all supply nectar to the insects which frequent them. It can be readily seen how

insects moving about in a flower will become loaded with the dust-like pollen, and in passing to other flowers aid much in transferring the pollen from one plant to another, and thus bring about a cross-fertilisation, or in other words, cross-breeding, which seems as essential to the production of vigorous and fertile plants as it does in animal life.

Among insects which aid largely in this interesting process no class is more useful than bees. Where imperfect fertilization has taken place fruit is incompletely developed in size and form, so that the quantity and quality are affected Careful investigation has shown that the fruitfulness of many plants is largely influenced by bees and such insects as search for the nectar and pollen of flowers.

Although many flowers have both stamens and pistils in the same flower, still scientific observation has shown that even in these cross-fertilziation is favored by the structure of the flower. From observations made it is claimed that orchards with bee-hives in them have been more fruitful than those without hives. In some cases bees have been given access to greenhouses so that the flowers might be fertilized, and thus develop more and better fruit under such conditions. Flowers have been covered so as to prevent insects reaching them, but light and air admitted. Side by side were others to which bees had access. An examination of the seed showed those of the former to be weak in vitality, those of the latter strong In many instances it has been observed where fruit trees were covered with bloom and poor results followed, that the weather at the time of bloom was cloudy, wet, and cold, and thus unfavorable to bees working among the flowers.

Scientific investigation indicates more and more as the question of fertilization is considered, that bees are important factors in the production of fruit and thus become co-workers with fruit-growers.

Bees in Relation to the Destruction of Fruit. Along this line of investigation exhaustive experiments have been carried on under the direction of the Department of Agriculture, U.S. Neither care nor expense was withheld by the apiculturist to whom the work was intrusted. Hives were kept within a building from which the bees could not escape. In this grapes, peaches, pears and plums, varying from green to dead ripe, were placed. The bees were deprived of food and left with the food exposed, so that they might feed upon it when hunger affected them. Many came to the fruit from time to time but never broke the skin, but where they found it broken they at once fed upon the exuding juice. They showed no tendency to use their jaws in cutting open a place. The test was continued for thirty days and other bees tried with similar results. In all cases food was taken only from fruit which had been previously broken. Consequently it appears that bees will not injure perfect fruit, a conclusion arrived at by many observers before these thorough experiments were undertaken. This is what might be expected when the construction of the bee's mouth is considered. It is quite different in the case of wasps, which are supplied with jaws suitable to break into the skin, and in all likelihood they are the cause of the injured fruit upon which some observers have seen bees feeding. Much evidence has been collected upon the amount of injury done by bees to fruit, and it all seems to be in favor of exonerating the bee from the charge of injuring sound fruit.

Paris Green in Relation to Bees. In several places where spraying is carried on extensively it has been observed that since the introduction of that practice many bees have perished during the time trees are in bloom, and some observers have noticed that the brood also perished.

Before the days of spraying such mortality was unknown. Now, although there has been no analysis of the bodies of the dead bees for the purpose of ascertaining the presence of arsenic, still the death of the bees is so intimately associated with spraying that there seems but little reason to believe otherwise than that the bees have been poisoned with Paris green used in spraying fruit trees. However this will likely soon be settled by an analysis of the bodies of bees supposed to have been poisoned, and I have no doubt arsenic will be detected. I suggest the propriety of bee-keepers forwarding some specimens of poisoned bees to the chemist of the Agricultural College.

Prof. Cook, of Michigan, has proved by experiment that a solution of Paris green in the proportion of 1 pound to 200 gallons (a common mixture used in spraying trees) proved fatal to bees in twenty-four hours.

Regarding the effect upon honey there is considerable diversity of opinion. The writer is not aware of any experiments having as yet been undertaken to show that even the honey is effected, though there is in the minds of some very practical men, (such as the inspector, Mr. McEvoy, who is thoroughly convinced), a great fear that honey produced at the time of spraying is a dangerous article of food. The writer would suggest that some such suspicious honey be sent to the chemist already referred to so that there may be no longer any doubt regarding the subject.

Experiment in the laboratory and observation by practical men indicate that spraying trees in bloom with Paris green is followed by most disastrous results to bees in the neighborhood, and no doubt some degree of injury to the trees as far as fruit is concerned.

The Time to Spray. To spray when trees are in bloom is a great mistake, because it is a waste of material, time and fruit. The plum curculio and codling moth are the chief enemies we seek to destroy with Paris green. The adult of the former lays its eggs in the plum just beneath the skin and is not likely to be present to any great extent till the fruit is *set*, consequently applying the poison while the trees are in bloom is commencing the attack too soon. If thought necessary to attack insects before the time of bloom, spraying may be done, and afterwards, but certainly *never while the trees are in flower.*

In the case of the codling moth which deposits its eggs in the blossom end of the young apple, a mistake is also made by spraying before the fruit is set, which does not take place till the bloom is off.

The portion of the pistil upon which the pollen falls is exceedingly tender and sensitive, so much so, that the application of such substances as Paris green injure it to so great an extent that the process of fertilization is affected and the development of fruit checked. With these facts before us as revealed by scientific investigation, it does seem strange that anyone would attempt to spray at a time not in accord with the teachings of science, and that anyone would feel it a hardship to conform to the requirements of a law calculated to protect the interests of two so important classes as the producers of fruit and honey. Spraying is only in its infancy, but as time rolls on and this practice becomes more general, the practicability of the law referred to will become more evident and the efforts of those seeking to enforce it thoroughly appreciated.

METEOROLOGY.

Observations are regularly taken at the hours of 8 a.m. and 8 p.m. daily, and recorded in a book printed for the purpose. The instruments in use are as follows:

Barometer—Showing the atmospheric pressure at the time of observation.

Maximum thermometer—Indicating the highest temperature between times of observation.

Minimum thermometer—Indicating the lowest temperature between times of observation.

Pluviameter—Used in measuring the rainfall.

Thermometer—For observing ordinary temperature.

Besides taking observations from these instruments, the cloudiness of the sky is observed, and general remarks on the weather for the day are recorded in the daily register. At the close of each month a summary of the month's observations is made out. From these summaries the statement of the year's meteorology is made.

In conclusion, allow me to thank you, and through you the Minister of Agriculture, who has so kindly furnished us with the means by which we have been able to do so much towards increasing our facilities to make the department of Natural History instructive, attractive and practical.

Yours respectfully,

J. HOYES PANTON,

Professor of Natural History.

O. A. C. Guelph,
December 31st, 1892.

PART III.

REPORT OF

THE PROFESSOR OF CHEMISTRY.

To the President of the Ontario Agricultural College:

Sir,—The past year has been one of unusual interest and activity in this department. A determined effort is being made to meet the two main purposes of the chemical department. As this is a teaching institution, we make it our first object to provide efficient instruction for our students, and, whenever we can, improve upon past methods. Chemical investigation, in conjunction with the field, dairy and live stock experiments of this station, presents a claim for our attention second only to that of instruction.

My report, therefore, is under two headings: (1) Teaching; (2) Analysis.

Teaching.

At the beginning of this term, the assistant chemist, Mr. H. B. Sharman, B.S.A., was relieved almost entirely from teaching and other class duties that he might give most of his time uninterruptedly to chemical analysis. The increased grant of money voted for the chemical department has enabled us to add largely to the stock of chemicals and apparatus required for class purposes. With this additional equipment, we have been able to make the course of instruction more practical and, we think, more thorough than it has been hitherto. Our department is still without a room where first year students, when sufficiently advanced, can work at their own laboratory desks or tables. Such a room is very much needed. The basement properly fitted up would answer very well; but that portion of building is still occupied with experimental grains. Our third year class is twice as large as it has been during any year of its existence, and this increase has necessitated the expenditure of a larger proportion of our grant for third year supplies than was anticipated. To accommodate this large class, nearly all the available space in the analytical room is occupied. While maintaining the usual broad course of instruction, we intend that the third year men shall give a little more time to the analysis of feeding stuffs, soils, etc, than was given by former classes.

Analysis.

During the past year, a great variety of substances, such as soils, marls, prepared fertilizers, rocks, drinking water, etc., has been sent to this laboratory for chemical analysis. Unless in a few instances in which the analysis is of general importance, we refer those sending these miscellaneous substances to private laboratories. We do so for the reason that the analytical work of this station is far greater than can be accomplished with our present assistance, and we do not think it right to exclude analyses of Provincial interest to do private work of this kind.

Manure Analyses.

At the close of the experiment (April 12th), "Feeding Shorn and Unshorn Lambs in Winter," the manure was carefully sampled under my personal supervision and analysed. The manure also from "Fattening Lambs for the British Market," was likewise sampled and analysed. The results are reported in connection with the experiments by Prof. Shaw and Mr. C. A. Zavitz in Bulletins LXXVIII and LXXXIII. At the present time we are analysing manure made by a cattle beast during the successive periods of its growth. The results are given in Part VII of this report.

Milk and Butter Analyses.

In continuation of the investigation begun in 1891 as to the effect of food on milk and butter, we have made a great number of milk and butter analyses. This year the experiment proper covered a period of ten weeks. The cows were six in number, divided into two groups of three each called lot I and lot II. During one-half of the experimental period, lot I received a poor ration and lot II a rich ration. The order of feeding was reversed through the second half of the period, lot I receiving the rich ration and lot II the poor ration. On forty days *i.e.* four days of each week, the per cent. of water, fat and solids not fat in every cow's milk was determined. The water, fat, casein, ash, iodine number and melting point in fifteen samples of butter were determined. From lot I eight samples were taken, four while receiving the poor ration and four while receiving the rich ration. Seven samples were taken from lot II, four while being fed on the rich ration and three while being fed on the poor ration. The tabulated results of these analyses have been reported in connection with the experiments by Prof. Dean in Bulletin LXXX, "Effect of Food on Milk and Butter."

Water Tank.

The water tank in the upper part of the laboratory, asked for in last year's report, has given entire satisfaction, affording a constant supply of water and a regular pressure.

Cleaning and Painting.

The general appearance of our building has been very much improved by the thorough cleaning and repainting which it received early in the year.

Yours respectfully,

A. E. SHUTTLEWORTH,
Professor of Chemistry.

PART IV.

REPORT OF

PROFESSOR OF VETERINARY SCIENCE.

To the President of the Ontario Agricultural College:

Sir,—I beg to submit my annual report for the year 1892. During my eleven years' connection with the College, and professional attendance upon the stock of the farm, I have never been called upon for so little veterinary attendance. I attribute this comparative immunity from ill-health as due to the remarkable keenness of observation, vigilant care, and intelligent management of Mr. Joseph Barnett, who has the cattle, sheep, and swine under his immediate care. There has been only one fatal case of marked importance, which was the death of the Dorset bull, that was imported in the autumn of 1891. This case, from a professional standpoint, is interesting, chiefly on account of its rarity of occurrence. During this animal's stay of ninety days in quarantine, there was no unfavorable report with regard to his health, but on his arrival at the College it was noticed that his bowels were not sufficiently active, and that his appetite was not good. At first he responded to some extent to treatment, but soon began to grow gradually worse. The most marked symptoms were almost complete loss of appetite, inactivity of the bowels, and a tendency to bloating occasionally. The hand on being passed into the bowel encountered masses of solid material, the nature of which was not determined until after death. For four or five weeks the symptoms were combatted with medical agents, and every effort made to support the failing strength of the patient, but all was of no avail, so the animal was destroyed, and a *post mortem* made, which revealed the deposit of immense quantities of fat in the abdomen.

The presence of the great amount of fat was by no means astonishing, as the animal was in the most possible obese condition, but the peculiarity of the fatty deposits was that they were perfectly solid, having assumed a state adipose tissue occasionally does, on fat individuals, of marked induration. The large amount of fat present in the abdomen, together with its hardness, caused a mechanical impediment to the action of the bowels and stomach; hence the symptoms of indigestion. Having reached this stage of accumulation and hardness, it was impossible for absorption of the fat to take place, so that death was only a question of time after the action of the bowels and stomach were suspended. The canal of the bowels, instead of being an inch or more in some places in diameter, was almost completely occluded by the pressure of the fat surrounding its coats, so that their ceasing to act was not to be wondered at. The occurrence of a case of this sort, although rare, is one of the possible results that a feeder for the show ring may experience.

Tuberculosis.

Fortunately during the last year we have encountered no trouble from tuberculosis amongst the College herd, but it is a disease that is liable to make its appearance, under varying circumstances, at any time, particularly in pure bred herds of

certain breeds, so that the stock owners of this Province should receive all the aid available from the Department of Agriculture in order to control this trouble as much as possible. Hence my reason for drawing attention to the most advanced efforts that have been made to get this disease under restraint. It is well known that the symptoms of tuberculosis vary exceedingly with the location of the lesions, and that sometimes the disease may be quite severe, but so located that diagnosis by the ordinary methods is impossible. The tubercles may be situated in the liver, udder, intestines, or lungs, and not be discovered by a most careful physical examination. Then, auscultation of the lungs of cattle cannot be depended on to the extent to which we rely upon the results obtained by this method of examination in man, the horse or the dog. Sounds are heard, even in healthy lungs, which will deceive the most experienced ear, and slight lesions of the mucous membrane of the bronchial tubes may produce sounds simulating those heard in pulmonary tuberculosis.

So when a disease appears in a herd and the evidently affected are removed, we have no certainty that there are not more subjects of tuberculosis remaining to scatter the germs broadcast and perpetuate the disease. In fact, this is the usual history of cases in which eradication is attempted. We have lacked a reasonably sure means of diagnosis, and this short-coming has served to make it impossible to carry out most of the measures advocated to suppress the disease.

In December, 1890, Koch announced his discovery of a substance which had a specific action on tubercular processes, which, when properly administered, caused a hyperæmia around the tubercle and an elevation of the body temperature. This action was not observed when the substance was injected into healthy men or animals, or into subjects of disease other than tuberculosis. This substance is known as Koch's lymph or tuberculin, and it was hoped for a time that it would cure consumption. But this hope has been abandoned.

In January, 1891, Prof. Gutmann, of the Veterinary Institute of Dorpat, Russia, employed tuberculin in cattle and found that the results were quite similar to those obtained on man. That is, there was a temperature reaction on tuberculous cattle, and none in other cattle. The substance has since been used in the diagnosis of tuberculosis of cattle in every civilized land, and the reports are almost uniformily favorable. The Tuberculosis Commission of the University of Pennsylvania, of which Prof. Zuill was chairman, introduced its use for diagnostic purposes in this country, and the report of this commission was cautious, because the number of their experiments was limited, but it was decidedly favorable. The Imperial Health Officer in Berlin has recently published an extensive report on the use of tuberculin in the diagnosis of tuberculosis of cattle, which says that it has been found reliable in all sorts of cases. Even when the lesion is hidden and the animal appears healthy, tuberculin reveals the presence of the disease. The Berlin *Veterinary Weekly*, of which Prof. Dieckerhoff is the senior editor, contained an editorial in a recent number in which this statement occurred : "The proof which has been presented to our readers is more than sufficient. The results are absolute and gratifying, and show that tuberculin is a reliable agent for determining the presence of tuberculosis in cattle. When animals do not react after the injection of tuberculin it can be said with almost absolute certainty that they are free from tuberculosis ; since not a single case has been unquestionably established in which animals containing tubercles have not reacted."

The method of using tuberculin is as follows : A ten per cent. solution is made in a one per cent. solution of carbolic acid, and of this dilution 2.5 to 5.0 cc. are injected beneath the disinfected skin in the region of the shoulder. The temperature is taken for fifteen hours at intervals of three hours, and if an elevation beyond the normal variation occurs, it is a reaction, and the animal probably has tuberculosis. The amount of reaction varies from two to six degrees, and lasts from twelve to twenty-four hours, or sometimes longer.

Respectfully submitted,

F. C. GRENSIDE, V. S.

PART V.

REPORT OF

THE FOREMAN OF THE HORTICULTURAL DEPARTMENT.

To the President of the Ontario Agricultural College:

SIR,—In submitting to you a statement of the garden and orchard produce supplied to the College during the year, I have much pleasure in saying that owing to the unusually favorable season for vegetable growth, garden crops of all kinds were abundant in quantity and good in quality, as they have been with us for the last six or eight years. Our kitchen garden from successive enriching, principally with barnyard manure, is now in such a fertile condition that failure in any culinary crops is a rare exception. Hence it is needless to particularize any special crop when nearly all were equally good and in excess of an average yield. The season was also favorable for all kinds of planting and transplanting trees, shrubs, etc. The young orchard planted two years ago in field No. 12, is now fairly well established. The apple and pear trees stood the last winter well, have made a fair growth this season, and look quite promising. The small fruits in the same field, including grape vines, raspberries, currants, gooseberries, and strawberries, have all done extra well. The raspberries were a full crop, producing all that were required during the fruiting season, as well as a sufficient supply for canning and preserving. The currants and gooseberries, being but young bushes, have not borne much, but are improving from year to year. They are strong healthy plants, of good varieties, and, from their promising appearance, we think that they are likely to meet in full for years to come all demands for home consumption. The young grape vines have barely reached the bearing stage, so only a small quantity of fruits may be expected the next few years.

THE VINERY. It may not be out of place here to review briefly some of the work undertaken and accomplished by this department during the last ten or twelve years. The old grape vines planted eleven years ago under the direction of the Fruit-Growers' Association and selected by them as an experimental test of vine-growing in this section of the Province, have never proved satisfactory; and this fall they have been rooted out as cumberers of the ground, to give place to other, and I trust more successful experimental work. Our lack of success is due, I believe, to the two following reasons: First, the vines were planted in field No. 16, where the soil is a clay loam, the subsoil clay with boulders, and very spongy—the field being undrained. In consequence of this cold bottom, they were late in making their growth and could neither ripen their fruit nor mature the wood. Second, many of them were such varieties as are not likely to succeed in this locality, even under more favorable circumstances. The 760 vines then planted, covering about two and a half acres, were composed of 98 varieties, the great majority of which, we believe, will never be productive in this part of the country. The Concord is, perhaps, the best known as well as the most prolific grape grown in this country; and our experience tells us that any later variety cannot be successfully grown for profit in this section.

From this standpoint the vines for our new vineyard have been selected. They are 140 in number, and comprise the following varieties, which we would place in order of

merit as follows, viz.: Worden, Moore's Early, Salem, Delaware, Montgomery (red), Lindley, Brighton, Agawam, Wyoming (red), Roger's No. 28, Roger's No. 41, Early Victor, Lady, Moyer and Concord. This order may not coincide with the experience of every grower. Of course new and untried varieties, as well as very favorable aspects, may break any such arrangements; but from our rather extensive list, we have selected the above as likely to prove fairly successfully in this neighborhood.

Tree Clumps. The forest tree clumps continue healthy and have made a good average annual growth. The walnuts planted in fields Nos. 16 and 17 eleven years ago have become quite thick, the branches so interlacing that they now require to be thinned out at least one-half, in order to give the remaining trees a chance for further development. The same may be said of field No. 2 where two clumps were planted, one of European larch in 1881, and the other the following year composed of a variety of trees raised from seed, some in the garden and some in the experiment grounds; and although they were quite small when planted, they have grown luxuriantly since, and now make a dense mass, so close that further cultivation is impracticable until they are thinned out, which should be done this winter.

In 1887 another plantation was set out in field No. 3, about three acres in extent, the object being to cover a large unsightly and comparatively useless gravel knoll and old pit which lay in full view from the College buildings. This plantation is composed of larch, Norway spruce, Austrian pine, walnut, butternut, birch, English ash, American ash, Norway and hard maple, elm, sycamore and linden planted in lines eight feet apart. All these trees have made good growth; they now nearly cover the ground and present a fresh and pleasant variety of foliage as seen from the College buildings. In field No. 4, a portion of which is situated on the rising ground nearly south of the College, about four acres in extent, which up to five years ago lay in a very rough state, denuded of all the principal wood, the ground was unbroken and used as a cattle and sheep run apparently for years. In 1887 the clearing was finished and the ground plowed up. Two farm crops were taken, the field partly levelled, and put in good condition for planting, which was done in the spring of 1890, principally with trees as already named, to which was added some young mountain ash, hickory, catalpa, and sweet chestnut, all of which are now fairly well established, and for years to come, from a landscape standpoint, will add materially to the appearance of the ground. The effect might be yet further improved by cutting down a number of old basswood and scrub elms, etc., which stand in the lower portion of the field obstructing the view from the College.

The said clumps have all been planted with trees raised either from seed or grown from seedling plants in our small nursery established in field No. 13 eleven years ago. Its area is but little over half an acre, divided into five plots by ornamental hedges; but, although the space is small, it has done good service during its existence, and now contains from two to three thousand young trees, consisting of Norway and white spruce, Colorado blue spruce, a few larch, elm, white ash, catalpa, and from twelve to fifteen hundred Austrian pine, the latter about three feet high, well rooted and in first-class order for transplanting into permanent position. And I may here, at least, name an idea that has frequently occurred to me where they might be utilized; nearly one-half of field No. 17 has been kept in bush—but underbrushed and left open for cattle, sheep and hogs: consequently many of the larger trees are decaying and likely to continue doing so while under existing conditions. The south and western sides are much exposed, and heavy storms from those directions have already made a partial clearance. Now, if it is the intention of the powers that be to retain this as permanent bush, I would suggest fencing to exclude stock, and plant the said Austrian pine around the exposed sides and irregularly, in as far as the open space extends, which would do much to cover the broken and unsightly appearance it now presents and ultimately become a wind-break for the protection of the whole.

Lawn and Arboretum. Up to 1880 the College lawn existed only in name. The field in front of the buildings had been seeded down for several years; but it was with agricultural grasses, put in with a farm crop, the ground having been left so rough that the lands throughout were distinctly defined by the plow furrows; and part of an old orchard and the walls of an old building that had been burned down, stood near the centre. A few

clumps of Norway and native spruce had been planted, and a wind-break of native spruce along the western boundary, inside of which was a cultivated border containing a number of fine healthy specimen trees of Austrian pine and Norway spruce, interspersed with a number of deciduous shrubs. The whole ground, embracing about 15 acres, was considered rather extensive for a lawn, and the idea was conceived of planting an Arboretum, to consist of as many trees and shrubs, both deciduous and evergreen, ornamental or otherwise, as were likely to prove hardy enough for the climate. This matter was laid before the Commisssioner, and the further laying out and grading of the grounds urged upon his attention; but it was not until the spring of 1882 that a plan was procured and approved by the Government. A large collection of nearly 400 trees and shrubs was then selected and carefully planted in the nursery until the ground was prepared for them; work was commenced in the fall, by breaking up a portion of the ground, changing the principal entrance, and making new drives, made necessary by the erection of new buildings; grading and levelling was carried on as long as the frost would permit, as well as preparing for transplanting in the frozen state over one hundred of the evergreens above mentioned, which was done by digging a trench 15 or 18 inches wide around each tree, cutting all the large roots and partly undermining the ball. The trenches were then filled up with straw for the winter, to prevent the frost from getting underneath, but allowing the ball to get frozen through, Early the following spring those trees, varying in height from six to sixteen feet and in weight from one to two tons, according to size of tree, were successfully moved on a stoneboat by a team of horses to the desired positions without a single failure, the holes having been prepared for them in the fall. Much was, perhaps, due to the favorable season for such work; but we have yet some pleasure in pointing to the success of the experiment which our Canadian winters favor. The remaining portion of the grounds was broken up early in the season, the cultivation, grading and levelling were carried on throughout the summer, and a design for flower beds laid out and sodded, the whole involving much labor and an expenditure to the full amount of the appropriation, leaving the ground in good order for seeding down and planting, which was done the following spring. The Arboretum was arranged according the family or natural order of each, embracing 32 families, 100 genera and 350 distinct species and varieties, a complete list of which was given in the Report of 1882. Some of the trees and shrubs, notwithstanding what winter protection we could give them, have proved too tender for this locality and have left a few vacancies in the various groups; but, on the whole, the appearance of the grounds has improved from year to year; and this season, on account of the copious and timely showers, the grass has kept green throughout the summer; and the flower beds and borders, furnished as they were with over fifteen thousand flowering and decorative plants, never looked better, showing a continuous growth and bloom from the 1st of June to the end of October.

Greenhouses. The old greenhouses and workshops did good services in their day; but for years they have stood in the way of required improvements in that part of the grounds, which could not well be changed until the old structure is removed, a change much needed and long looked for; but now that they are superseded by buildings more worthy of their surroundings, I trust that provision will be made the coming season for the breaking up and grading of this portion of the grounds, which will complete the original plan and give a finished appearance to the whole. The new conservatory, store and greenhouse are now quite full. Looking forward to the increased space, we propagated and grew on from early in the season a greater number of such plants as we had, principally of a soft-wooded class, composed largely of chrysanthemums, begonias and geraniums, which have come in useful, and have made a good display of flowers during the fall and winter.

A consignment of large and valuable plants from the Central Prison has added much not only to the effective furnishing of the various houses in the meantime, but has given us a variety of such specimens as would take us years to grow. We are also indebted to several Toronto gardeners for donations of a varied and valuable assortment of plants. Although many of them are but small, they increase our variety, and, added to what we have, make a very creditable collection.

The following form shows the value of what was supplied to the College each month during the year at current rates, $739.02 ; also a small surplus sold for cash, $46.50.

Garden produce.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total for the year.
	$ c	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Apples	....	.....	.....	.....	.....	.....	.....	5 70	10 12	20 90	30 00	26 00	92 72
Asparagus	..	. ...	.....	.....	14 32	21 20	.....	.....	.....	.....	.....	.....	35 52
Beans	.....	.....	.....	....	.....	.....	2 40	80	30	.....	.....	.... .	3 50
Beets	.....	35	70	....	25	.....	90	30	.....	75	52	52	4 29
Cabbage	2 60	4 30	5 80	6 30	5 40	... ..	2 25	1 75	80	3 80	8 00	2 75	43 75
Carrots	... .	.....	.....	.....	.....	.....	30	60	15	1 40	90	1 00	4 35
Cauliflower	.....	.....	.....	.....	...	.....	4 00	7 35	50	5 95	.....	.....	17 80
Celery	2 40	3 60	1 69	.....	....	.....	.....	1 75	5 40	23 25	14 50	18 00	70 50
Cherries	.....	.....	...	.....	.....	.....	2 31	... .	.. ...	.....	....	....	2 31
Citrons	.....	.....	.....	.....	.....	.....	.....	.....	.....	9 00	.....	.....	9 00
Corn	.....	.....	....	... ..	.....	...	.....	6 00	3 78	.....	.....	.....	9 78
Cucumbers	.....	.....	.....	.....	.....	.	....	9 51	.....	.....	.....	.....	9 51
Currants	.....	....	.....	.....	.....	.....	13 96	....	....	....	.....	....	13 96
Gooseberries	....	....	.....	.....	.....	1 92	35 52	.....	.....	.....	. ...	.....	37 44
Grapes	....	.....	.....	.....	.....	.....	.....	.....	5 01	37 44	.....	.....	42 45
Herbs	.....	1 00	40	20	10	15	25	55	35	90	.....	15	4 05
Lettuce	.....	.....	.....	50	18 75	5 80	1 80	.....	.....	.....	.....	.....	26 85
Onions	2 25	3 75	1 25	3 90	20	20	40	.....	1 35	2 80	4 00	2 50	22 60
Parsnips	1 00	2 00	4 72	1 90	1 70	.....	.....	.....	20	2 40	2 00	1 60	17 52
Peas	.....	.....	.....	.....	.....	5 00	6 50	3 00	.....	32 40	.....	.....	46 90
Potatoes	.....	.....	.....	.....	.....	.....	13 50	19 50	6 80	.....	11 40	18 90	70 10
Raspberries	.....	.....	.....	.....	2 00	.....	12 11	14 56	.....	.. ...	.....	.....	28 67
Radish	.....	....	.....	70	8 70	3 50	.....	.....	.....	.....	....	.....	12 90
Rhubarb	.....	.....	.. ...	.....	.....	9 30	2 20	4 50	.....	.....	.....	.....	16 00
Spinach	.....	.....	.....	.....	.....	5 40	2 80	.....	35	.....	.....	.....	8 55
Squash	.....	.....	.....	.....	.....	.....	.....	80	.....	8 00	50	.....	9 30
Strawberries	.....	.....	.....	.....	.....	3 78	15 89	.....	.....	.....	.....	.....	19 67
Tomatoes	.....	.....	.....	.....	.....	.....	1 80	9 00	25 80	8 50	.....	.....	45 10
Turnips	60	2 20	1 50	1 00	1 10	30	.....	.....	.....	30	1 60	1 30	9 90
Sundries	1 00	25	30	30	15	38	30	15	30	15	30	45	4 03
Totals	9 85	17 45	16 27	14 80	52 67	56 93	119 19	85 82	61 21	157 94	73 72	73 17	739 02

Your obedient servant,

JAMES FORSYTH.

PART VI.

REPORT OF THE PHYSICIAN.

To the Honorable John Dryden, Minister of Agriculture:

SIR,—I have the honor of presenting to you my annual report:

During the first half of the year we had several severe cases of "la grippe;" and during the same period many of the students and some of the servants suffered from an inflammatory condition of the throat.

We had five mild cases of diphtheria; but nothing of a serious nature occurred.

One young man had a very narrow escape from being fatally injured. He fell off a mow in the barn and landed on the end of a fork handle, causing such injury as to confine him to bed and to his room for weeks; but in time he made a good recovery.

The improvements you have made this year in reference to ventilation and sewerage have made the sanitary condition of the College entirely satisfactory.

I have the honor to be, Sir,

Your obedient servant,

E. W. McGUIRE, M.D.,

Ontario Agricultural College, December 31, 1892. College Physician

PART VII.

REPORT OF

THE PROFESSOR OF AGRICULTURE

AND FARM SUPERINTENDENT.

ONTARIO AGRICULTURAL COLLEGE, EXPERIMENT STATION,
GUELPH, December 31st, 1892.

To the President:

SIR,—I have the honor of herewith submitting my report for the respective departments of this institution under my own immediate supervision. These include in addition to my own report proper, a joint report of the experimental work by Mr. C. A. Zavitz, B.S.A., assistant in the experimental department, and myself; the report of Mr. J. E. Storey, the farm foreman, and also that of Mr. James McIntosh, foreman in the mechanical department.

The work in both the farm and experimental departments has this year again been very successful. The crops grown as a rule were excellent, although the yields were by no means phenomenal as during the year 1891. The wet weather in the month of June which was probably without a parallel during recent years, not only injured some crops (as potatoes) but it very greatly hindered the progress of the work, and added to its expense. The field work in the experimental department was still further extended as will be more fully brought out when treating more particularly of that work. Nearly all the field work done now is more or less of an experimental character. It is, therefore, scarcely possible to clearly determine what belongs to the farm or to the experimental department.

The following is a summary of the principal items relating to the farm:

I. IMPROVEMENTS MADE DURING THE YEAR:

1. The improvements of roads. 2. The erection of fences. 3. Paving the barnyard. 4. Maintaining cleanliness in the fields. 5. Underdraining.

II. SPECIAL CROPS GROWN UPON THE FARM:

1. Rye and rape. 2. Lucerne. 3. Catch crops.

III. MISCELLANEOUS ITEMS:

1. The exhibits made. 2. The sale of live stock. 3. The sale of seed grain and potatoes. 4. Visitors during the year. 5. Work done for other departments. 6. Lambs purchased for feeding.

I. IMPROVEMENTS MADE DURING THE YEAR.

1. The Improvement of Roads.

Some attention was given to the roads constructed during previous years. As soon as the road-bed had settled firmly after the frost had left the ground, the roads were gone over with an iron hand rake and the stones drawn towards the centre of the road where they were left in a line. This work was done by one or two persons on opposite sides of the road, according as the road-bed was wide or narrow. Those engaged in the work face in the same direction. A cart drawn by a single horse was then driven directly over the line of stones lying in the road, and the stones thrown into the cart from behind by one person with a scoop shovel. Five students would in this way remove the loose stones from a mile of road in half a day. The stones were, of course, carted away to a proper receptacle for them. The roads in consequence were beautifully smooth during the whole season, and we fail to see why this plan could not be adopted on all gravel roads at that season of the year. The driving would thereby be very much improved during the whole of the season following.

The grading of the lane was continued on both sides of the Brock road. The road-bed was made 28 feet wide from the outside of the bordering ditches. The ditches are shallow and so shaped that there will be no difficulty in using the field mower on the whole road except the gravelled portion. The gravelled portion is 12 feet wide.

The field mower was used in cutting the grass on the Brock road late in the month of June, and also on the town-line road referred to in the report for 1889, p. 103. There were 3½ tons of hay taken from the sides of the Brock road during the early days of July. This road is one-half mile long. From the town line road an equally good cutting would have been obtained but for the cropping of sheep running at large. If the borders of public roads generally were so shaped that they could be thus kept clean, the labor and cost of keeping them in this condition would be reduced to a minimum.

2. The Erection of Fences.

The old fences were removed from both sides of the private road which runs far back into both divisions of the farm, and were replaced with new ones. This fence is the same in construction as that put up along the Brock road the previous year, and which is described in the report for 1891, pp. 48 and 141. There were erected in all about 500 rods of the same. The work of grading the road, levelling the borders, and building the new fence was nearly all done by the students and the regular help of the farm. As stated in the report of the previous year, we sedulously avoid using special grants to perform labor that can be done by our own help. Because of this line of procedure, improvements are not made nearly so quickly in some instances as if made through special grants.

3. Paving the Barnyard.

Late in autumn a portion of the barnyard was paved with field stones. The plan at first decided upon called for a pavement 16 feet wide from the stone wall in front of the sheep house, and 12 feet wide in front of the barn and horse stables, respectively, and asked that the inside corners should be rounded so that a loaded team could drive around the yard without leaving the pavement. We ventured, however, to extend the pavement to the width of 25 feet in front of the stone wall referred to above, that there would be ample room for all the stock to stand upon it on the sunny side of the yard and without going into the manure in the centre, and this change met with the approval of the Minister. I would here venture to recommend that next season the paving be extended to 25 feet in front of the horse stables, and also sufficiently far in front of the bull house to allow wagons to be brought into the yard without going off the pavement.

The stones used in paving are kept in place by dressed curb stones sunk into the earth. A sloping pavement descends from the curb stones to the portion of the yard

which receives the manure, and which is several inches lower than the top of the curb stones. This sloping pavement thus secures the double object of keeping the curb stones in place, and of allowing loaded wagons to drive up on the pavement on any part thereof. The whole pavement has sufficient slope to run the water which falls upon it into the central portion of the yard.

The laying of the pavement was done by hired labor, but the material was all laid down by the labor of the farm with student help. Some idea of the enormous amount of material wanted will be given when it is mentioned that the yard is 160 feet long and 105 feet broad. The work was deferred until the autumn plowing was nearly completed, that the labor of the farm would not be unduly interfered with. This was followed, however, by the disadvantage arising from unfavorable weather, while the work was being done, which added to its expense.

In sections where cobble stones and sand are plentiful, this plan of paving, at least a portion of the yard, is well worthy the attention of the farmer. It would of course be more prudent in many instances to do but a portion of the work each year as opportunity may offer.

4. Maintaining Cleanliness in the Fields.

In the report of 1891, p. 52, the following statement is made: "We expect to keep this farm clean henceforth, at an outlay of not more than $75 per annum over and above the ordinary methods of good cultivation. This estimate includes private roads, fence borders, unbroken pastures and bye places." A first year student, Mr. A. Walker, was engaged to give attention to this work, and an accurate account was kept daily of all time spent in this way. When Mr. Walker was not so employed he gave attention to other work on the farm If anyone else assisted Mr. Walker at any time, the labor so employed was carefully accounted for. The time thus spent in spudding and hand-pulling amounted to 512 hours. At 12½c. an hour this amounts to $64, or $11 less than the sum mentioned a year ago as the probable amount required.

The hoed crops were not cared for quite so perfectly as during the years immediately preceding. This was owing to the extraordinary rainfall through June and on into July, which deferred the season of attending to this until other crops were ready for harvesting, but on the whole they were so cared for that, all things considered, the returns were very satisfactory.

And here I desire to repeat and to emphasize what was said in the report of 1891, p. 52, viz., that when once a farm had been made fairly clean "The hand-spudding essential in keeping it clean of weeds, should not be more than $25 per year for 100 acres." The more I investigate the weed question, the more I am convinced that it is possible to entirely free our farms from the more noxious forms of weed life and to keep them so.

And I again appeal to the farmers of this country to put forth every reasonable effort to free their farms of every form of weed filth so far as this can be done. I make this appeal under the firm conviction that it will be found much more profitable to till a clean farm than one that is not clean. The methods of dealing with the more offensive and troublesome weeds of this Province are given later in the report.

5. Underdraining.

In field 17 we have been troubled more or less every season with the water gathering in the low parts, greatly to the detriment of the vegetation growing upon these. This year the field was thoroughly underdrained by laying 5-inch tiles in the main depressions and 2½-inch tiles as laterals leading into these. The former were sunk to the depth of 3 feet, and the latter to the depth of 2 feet 9 inches. The junctions were made in the usual way, viz., by chipping a hole in the side of the tile in the main, and adjusting the first tile of the lateral to this. We were unable to get junction tiles from any of the firms which make tiles in this vicinity. Six hundred and forty rods in all were laid in this field. The cost of digging the drains by contract was 25 cents per rod, without

board, and this included placing the tiles in position. The filling was done by farm labor. In constructing these drains, old drains were found in the same field, some made with tiles and some with stones, but they were evidently not working. The field was plowed immediately after the tiles had been laid, in the month of June, and sowed with rape. The grapery which occupied one portion of this field was taken away late in the season and the fence removed which surrounded it. The entire field, comprising 20 acres, will now be devoted to experimental work, and this addition to the acreage of that department should greatly increase its effectiveness.

Late in the season another main drain was carried up from this field into the experimental field, No. 18, above it, and some short laterals were put in, in one part, where sometimes there had been a superabundance of moisture. The entire length of these drains was 64 rods.

In field No. 16 also, drains were laid in low places at both ends of the same, and here again traces were found of drains that had ceased to fulfil the ends for which they had been constructed. These drains were in all 184 rods in length.

II. SPECIAL CROPS GROWN UPON THE FARM.

1. Rye and Rape.

The forty acres of rye sown upon the farm in the autumn of 1891 grew magnificently, but, as stated in the report of the farm foreman, we failed in the attempt to cure the portion cut for fodder, owing to the successive and prolonged rains in June After 30 acres had been put in shock we judged it better to defer cutting the balance of the 40 acres, and as the showers continued to fall it was allowed to ripen. The whole of the ground on which the rye had been cut early, was at once plowed, drilled, and sowed with rape, along with the whole of field No. 17, referred to as having been drained. But to our great chagrin we found that the major portion of the rape seed sown was a variety which was not possessed of much feeding value. It bore but few leaves, with a large amount of fibrous stalk, and came out into blossom in less than two months from the time of sowing it, whereas the true Dwarf Essex does not come into blossom the same season that it is sown.

We are not yet quite certain as to the true name of this variety of rape, as we have not been able to glean information of a satisfactory character in reference thereto on either side of the Atlantic. The idea has gained currency that it is the German Bird or summer rape. But this view is not correct, as we grew the Bird rape true to name, and it has but little resemblance to the aforementioned variety. The Bird rape is much less vigorous, branches more widely, and comes sooner to maturity. The kind which we purchased for the Dwarf Essex is probably a hybrid variety which is grown for the oil got from the seeds. We obtained a small quantity of what proved to be the same variety from an American seedsman and which was labelled the "Broad Leaf Dwarf Essex." This seed was sown in one of the experimental plots, but we have good reasons for suspecting the integrity of the name.

At all events the same species of rape was sown extensively in this country, and in considerable test quantities in the United States. The seedsmen in Ontario assure us that they ordered the Dwarf Essex as usual when laying in their stock of seeds, hence the mistake was made by seedsmen on the other side of the Atlantic. To prevent the repetition of the occurrence, for it is a serious one, we would venture the suggestion that seedsmen lay in their stocks early, and prove trueness to name by actual trial.

The mistake thus made was peculiarly unfortunate for our work here. It prevented us from realizing properly on the lambs purchased for feeding, and it marred extensive experiments planned with much care in reference to various modes of growing rape, to the extent of rendering them valueless. A large number of letters were received in the autumn enquiring whether there would be any real danger that some of the seeds would mature and thus grow in the crop the following year. In many instances the crop was turned under when in full bloom lest such a result should follow. We found that these precautionary measures were not necessary, for when the lambs

were turned in upon the rape the blossoms and seed pods were the parts that were first eaten. It may also be mentioned here that now that we do not require to grow rape to anything like the same extent for cleaning the land, we will grow it henceforth more as a catch crop after some other crop has been removed, as meadow or grain.

2. Lucerne.

We find that lucerne is a valuable plant to grow on this farm. We have grown it in various ways, but more especially by sowing it along with the grass seeds in meadows. When thus grown it is usually ready for cutting somewhat in advance of the other grasses. This is so far objectionable, as, unless it is cut quite promptly at a certain stage of growth, it becomes quite woody, and hence it is much less relished by the stock. In such instances the leaves also fall off readily when it is being cured, which still further impairs its value. But it furnishes a fine lot of pasture after the removal of the hay, and this result is relatively more marked in dry seasons, owing to the deep feeding habits of this plant.

To ascertain more accurately its value as a fodder plant on soils such as we have here, we determined to sow a field of it alone. The poorest field on the farm was chosen, viz., No. 21. It has received very little manure for many years past. It contains 12 acres, but the test will be confined to 8 acres, as the remainder is as yet imperfectly drained, and must remain so until some change is made in relation to the lands bordering upon it, which are not the property of the Government. The eight acres are somewhat rolling. The soil is what may be termed a clay loam, with an inclination to gravel, more especially in the higher portions. The subsoil is gravelly, but is not real gravel.

The lucerne was sown on this field in the early spring at the rate of 15 pounds of the seed to the acre. It was sown with the ordinary seed drill and along with one bushel per acre of the Oderbrucker barley. Fortunately for the results from the barley crop in the present condition of the field as to fertility, the season proved wet. The barley gave a return of 22 bushels to the acre. The straw of the barley had so much lucerne mixed with it that it will make valuable feed, but it was a little difficult to cure. The lucerne at once sprang up again, after the barley was harvested and in the month of October presented a lovely appearance. The whole field was covered with one mass of foliage fully one foot in height, beautifully even and without any weeds. Had the season been dry the results would not have been nearly so successful. With the very excellent stand which the lucerne made last autumn we do not apprehend any danger from the coming winter, hence it is likely to pass the critical time without injury. If we can get lucerne safely past the first winter it will retain its foothold for many years in suitable soils.

It is our purpose to mow this crop as frequently as necessary, and to cure it for hay, to ascertain what the average yield will be for a term of years, and to test its feeding value more accurately than has hitherto been done in this country. We should also learn a valuable lesson as to the effects which the crop will have in bringing fertility to this impoverished field.

We have also sown lucerne along with the common red clover and tall oat grass in field No. 1, as stated in the report of the farm foreman. The idea is to get mixed forage plants that may be cut twice a year for at least two years in succession. The outlook is very promising in the meantime.

I would not have the reader conclude that lucerne would be a valuable crop for every farmer to sow; far from it. On some kinds of soil it will grow indifferently, and where the subsoils are cold and wet it should not be sown at all. We have yet to demonstrate, even on this farm, evidently well adapted to its growth, that it will prove more remunerative in the end than the common red clover.

3. Catch Crops.

They were not grown to any great extent the past year for reasons previously stated when speaking of maintaining cleanliness in the fields. Rape was sown in field No. 6 after the removal of the wheat and rye, and furnished a considerable amount of pasture.

III. MISCELLANEOUS ITEMS.

1. The Exhibits Made.

The usual exhibit of grains was made at some of the leading exhibitions, as the Toronto Industrial, and the Western Exhibition held at London. A smaller exhibit was also made at Kingston. There were no less than 452 varieties of cereal grains and corn exhibited. The 314 varieties of wheat, oats and barley were also exhibited in the straw. All these were grown upon the farm in 1892. More details of the exhibit and also a sketch of the same as shown at the Western Exhibition, London, are given later in the report of the experimental department. An exhibit is being sent by this department to the World's Fair, Chicago, which will contain all the varieties included in the above summary. These have not only been all grown upon the farm, but they have been selected with much care, and it is hoped that the exhibit will not bring any dishonor on the department making it, or on the Province.

2. The Sale of Live Stock.

The annual sale of surplus live stock was this year held in the Victoria rink on December 15th, the second day of the fat stock show. The following animals were sold, viz: 5 Shorthorns, 3 Herefords, 1 Galloway, 1 Sussex, 1 Devon, 1 Red Poll, 4 Ayrshires, and 2 Holsteins; and of pigs, 3 Berkshires, 20 improved Yorkshires, and 13 Tamworths. The proceeds of the sale of the animals sold from the farm department was $1,456.50.

3. The Sale of Seed Grain and Potatoes.

The varieties of grain imported from various countries that have been found well adapted to the conditions of growth in this country are now furnishing considerable quantities of seed for distribution among the farmers. When we find that any of these new introductions do very well the first year, we sow them again in larger quantities, and if the results are again favorable, we sow them a third time in still larger areas. By the end of the third year we have considerable quantities of the seed for distribution and for sale. The mode of distribution is described in the report of the work of the Experimental Union toward the close of this volume. The grains and other products sold for seed are put upon the market at moderate prices, that they may be made easily accessible to the farmer. During the year considerable quantities of fall wheat, barley, oats, and peas were thus sold, and also several varieties of potatoes. But in some instances we find much difficulty in keeping varieties separate and pure, owing to the power that some kinds of oats possess of living over winter in the soil, and also to other reasons. Intimation of the kinds held for sale is given every year in one or other of the bulletins issued from time to time.

4. Visitors During the Year.

The number of visitors at the farm during the past year was greater than ever before. The estimate upon the number who came in 1891 was put at 15,000 in the report for that year, hence if that estimate is approximately correct, the number who came this year would be still greater. Sometimes there were from 2,000 to 3,000 persons on the farm in a single day in June, the month of farmers' excursions. While those in charge of the farm department are greatly pleased to have their work inspected, they would call attention to the difficulty of having everything without flaw or defect during a busy month, when much of the time is of necessity occupied with visitors. We think, however, that it is a matter for thankfulness that visitors come in such crowds at that season, when the field work can be inspected to good advantage. It may be mentioned here that

late in the month of July the field crops can be examined with most advantage. It speaks of an interest on the part of the farming community that is radiant with hope for the future, and we can only add in this connection, come and welcome, for if our work will not stand rigid inspection it deserves to be publicly condemned, along with those who conduct it. It is a matter of regret to know that more attention cannot be given by the officers of the farm and experimental departments, when visitors come in large numbers, that such visits may be made more profitable to them and to us. But a still greater difficulty is found in the lack of guidance given to ordinary visitors who come from day to day. We frequently are unable to spend that time with them of which they are deserving, and which it would seem to be in the interests of the institution to give them. I therefore repeat the suggestion made in the report for 1891, page 57, "That the services of some one be secured whose special duty would be to see that visitors were properly entertained." There would be no difficulty in finding ample useful employment for such an individual when not engaged in directing visitors.

5. Work Done for the Other Departments.

There is usually a large amount of work done by the farm for the other departments, as the College, the dairy, and the experimental, which tends in no small degree to increase the expenditure of the farm. In view of this, I would recommend that a system of book-keeping be adopted in future which would duly credit each department for work done for the others, or for supplies furnished them.

6. Lambs Purchased for Feeding.

Lambs were purchased this year again for feeding by Mr. J. E. Story, the farm foreman. Three hundred and sixty-nine head in all were bought. The first lot were purchased in Durham county, and were shipped from Burketon on the C. P. R. to Guelph. They arrived on September 14th. The second lot were shipped from Kincardine, County of Bruce, and arrived September 29th. The outlay was as follows :

	Lot 1.	Lot 2.
Cash for lambs	$657 80	$753 30
Expenses purchasing	26 80	10 10
Freight	33 80	8 00
Total	$718 40	$771.40—$1,489 80

The average cost per head of the lambs in lot 1, when laid down in Guelph, was $3.93, and those in lot 2, $4.14. The average cost per head of the whole lot of 369 lambs was $4.04. Of these 100 head were shorn in October for experimental purposes and they are still on hand.

The sum received for the lambs sold, including the wool from those under experiment, was $1,291.00. They went to the Buffalo market. Had the 100 lambs now under experiment been sold at the same time, and at the same rate, we would have realized for the lot $1,816.00, or an advance on the total cost price of $326.20.

Respectfully submitted,

THOMAS SHAW,

Professor of Agriculture and Farm Superintendent.

EXPERIMENTAL DEPARTMENT.

The work in this department has been still further extended, notwithstanding the marked advances of the previous year.

The following is a concise summary of the principal experiments conducted:

Field Experiments.

1	Barley	90 plots.	
2	Peas	85 "	
3	Spring wheat	97 "	
4	Winter "	90 "	
5	Oats	154 "	
6	Potatoes	178 "	
7	Turnips	117 "	
8	Mangels	59 "	
9	Carrots	46 "	
10	Sugar beets	10 plots.	
11	Fodder corn	230 "	
12	Mixed grains for fodder	25 "	
13	Rape	70 "	
14	Millet	20 "	
15	Clover	39 "	
16	Grasses	80 "	
17	Miscellaneous	18 "	
18	Co-operative tests for 1892	115	
	Total	1,523	

These include variety tests, 942 plots; methods of cultivation, 233; application of fertilizers, 60; sowing grain at different dates, 48; selection of seed grain, 10; cutting grain at different stages of maturity, 24; growing grain for fodder in different combinations, 25; growing rape on different kinds of soil, 8; methods of preparing potatoes for planting, 20; methods of improving old grass land 38; and co-operative tests, 115 plots. The plots vary in size from 1 to 320 square rods, and cover an area of about 100 acres.

Live Stock Experiments.

1	Cattle, six experiments	23	animals
2	Lambs, three "	666	"
3	Swine, one "	12	"
	Total	701	

These experiments relate to the feeding and handling of the animals, to the manurial product, and to the effects of close confinement.

Co-operative Experiments.

A system of co-operative experiments is carried on over the Province through the Experimental Union, an association composed of officers, students, and ex-students of the College. A cordial invitation is extended to all progressive farmers to co-operate in this work. Seed and fertilizers, with the necessary instructions, are furnished by the station. The number and nature of the experiments which have been conducted during the present season is as follows:

1	Fertilizers	165	plots
2	Fodder crops	470	"
3	Roots	705	"
4	Spring grains	2,748	"
5	Winter grains	1,600	"
	Total	5,688	"

These include 12 distinct experiments, each of which is also carefully conducted at this station.

Although the yields of grain were not equal to those of the previous year, they were encouraging. The results of the experimental work were, on the whole, satisfactory, except with the rape plots, where the seed purchased was not true to name. Apart from this there were but few failures from any source whatever.

The live stock experiments were also satisfactory. It may be mentioned here that but little was done by way of experimenting with swine, notwithstanding the importance of the industry to this Province. In explanation we may mention that with the stock on hand there was no room for conducting these. We are pleased to be able to note that the piggery for which estimates were made two years ago is now under way, so that next year we hope to enter more fully on this important line of experiment.

The great increase in the number of the co-operative experiments is very gratifying, as it speaks of the increasing interest taken by the farmers in securing new varieties of grain. We look upon this work as greatly important. We can learn from it in a short time the suitability of any variety of grain, root or fodder crop for different sections of the country which may have given encouraging results at the station. It also paves the way for the extensive introduction of promising varieties, and it enables the farmer to test the value of commercial fertilizers with but little outlay, and to judge thereby of the wants of his soil.

As it is of great importance in connection with experimental field work to note the temperature of the weather and the amount of rainfall, we append the following in regard to these taken from observations made upon the premises the past six years:

Month.	1887.	1888.	1889.	1890.	1891.	1892.
	inches.	inches.	inches.	inches.	inches.	inches.
May	1.58	1.08	3.59	2.18	.68	3.67
June	2.36	2.92	4.25	5.31	1.15	4.50
July	.61	2.21	2.67	1.44	3.54	3.15
August	2.71	2.16	1.92	1.74	3.96	3.15
September	1.52	1.55	1.04	.72	2.62	2.44
Total	8.78	9.92	13.47	11.39	11.95	16.91

The average temperatures for each month of the same period were as follows:

Month.	1887.	1888	1889.	1890.	1891.	1892.
May	60.49	50.98	52.3	50.7	50.4	53.0
June	65.02	64.36	59.8	65.4	66.4	58.8
July	72.87	67.22	67.8	68.2	62.7	67.8
August	65.58	66.56	64.4	62.8	63.7	65.5
September	55.83	54.96	58.3	55.4	61.2	57.6
Average	63.96	60.82	60.5	60.5	60.9	60.5

For the information contained in the portion of the above tables which relates to 1892, we are indebted to the Meteorological Department, in charge of Prof. Panton.

I. FIELD PLOT EXPERIMENTS.

Cereals.

(*a*) Cereals on small plots.

1. Barley, comparative test of 67 varieties.
2. Barley, different dates of seeding.
3. Peas, comparative test of 61 varieties.
4. Peas, different dates of seeding.
5. Spring Wheat, comparative test of 63 varieties.
6. Spring wheat, different dates of seeding.
7. Winter wheat, comparative test of 62 varieties.
8. Winter wheat, application of fertilizers.
9. Oats, comparative test of 116 varieties.
10. Oats, different dates of seeding.
11. Barley and peas, selection of seed.
12. Barley, peas, spring wheat and oats, harvesting at different stages of maturity.

(*b*) Cereals on large plots.

13. Barley.
14. Spring wheat.
15. Winter wheat.
16. Oats.

Potatoes and roots.

17. Potatoes, comparative test of 118 varieties.
18. Potatoes, different depths of planting the seed of tuber.
19. Potatoes, preparation of seed tubers.
20. Potatoes, different dates of seeding.
21. Potatoes, application of fertilizers,
22. Swede turnips, comparative test of 44 varieties.
23. Swede turnips, thinning plants in the drill.
24. Swede turnips, different distances between the drills.
25. Fall turnips, comparative test of 18 varieties.
26. Fall turnips, thinning plants in the drill.
27. Mangels, comparative test of 35 varieties.
28. Mangels, thinning plants in the drill.
29. Mangels, different distances between the drills.
30. Carrots, comparative test of 23 varieties.
31. Carrots, thinning plants in the drill.
32. Carrots, different distances between the drills.
33. Sugar beets, comparative test of 10 varieties.

Silage and Forage Crops.

34. Fodder corn, comparative test of 73 varieties.
35. Fodder corn, different distances between drills, and between plants in drill.
36. Mixed grain, grown for fodder purposes.
37. Peas and oats, sown in different quantities for fodder purposes.
38. Rape, its growth and uses.
39. Millet, comparative test of 11 varieties.
40. Clover, comparative test of 18 varieties.
41. Grasses, comparative test of 40 varieties.
42. Sunflower, comparative test of three varieties.
43. Miscellaneous crops.

II. LIVE STOCK EXPERIMENTS.

44. Feeding steers of different breeds from birth until two years old.
45. Fattening steers on ensilage and meal; ensilage, hay and meal; and roots, hay and meal.
46. Feeding rape to cows for milk production.
47. Feeding calves on skimmed milk, skimmed milk with linseed meal; and new milk.
48. Determining the amount of manure made by a cattle beast, during successive periods of its growth.
49. Determining the relative value of different varieties of clover hay and three varieties of sunflower, for milk production.
50. Determining the effect of constant confinement upon the breeding properties of a cattle beast.
51. Fattening lambs on rape, and finishing them on a winter ration for the Canadian and American markets.
52. Feeding lambs for the British market.
53. Fattening lambs on mixed grain, hay and roots; oats, hay and roots; and mixed grain, hay and ensilage.
54. Feeding shorn and unshorn lambs in winter.
55. Feeding swine upon rape and meal in the pen; rape and meal in the field; and rape alone in the field.

III. CO-OPERATIVE EXPERIMENTS.

56. Testing nitrate of soda, superphosphate, muriate of potash, mixture, and no fertilizer with oats.
57. Comparing the advantage of nitrate of soda over no fertilizer with rape.
58. Ascertaining the relative value of three varieties of millet.
59. Growing lucerne as a crop of fodder.
60. Testing six promising varieties of fodder corn.
61. Testing five promising varieties of turnips.
62. Testing five promising varieties of mangels.
63. Testing five promising varieties of carrots.
64. Testing six promising varieties of spring wheat.
65. Testing six promising varieties of barley.
66. Testing six promising varieties of oats.
67. Testing five promising varieties of winter wheat.

IV. WEEDS AND MODES OF DESTROYING THEM.

General principles to be observed in destroying Weeds.
Specific modes of destroying our most troublesome Weeds.

V. GRAIN EXHIBITS.

Exhibit for Ontario during 1892.
Exhibit for the World's Columbian Exposition.

VI. EXPERIMENTAL BUILDING.

I. FIELD PLOT EXPERIMENTS.

The field plot experiments during 1892 belong to eight different fields. These plots varied in size from one square rod to two acres. Nearly everything grown upon the farm was of the character of an experiment, but plots over two acres in size are not included when enumerating the area covered by experimental work.

CEREALS.

Of these 379 varieties were grown in 1892, and they represent the first, second, third or fourth year's crop from Ontario and foreign grains. The foreign grains have nearly all been imported within the past four years. They were obtained from the following countries: England, Scotland, France, Germany, Switzerland, Sweden, Russia, Italy, Hungary, Greece, Sicily, Africa, Japan, New Zealand, Australia and the United States. When grains are first introduced we grow them on small plots. Those which promise well we sow upon larger plots the second year. If they still maintain their reputation they are sown on yet larger areas the third year, so that a supply of the seed may be available for distribution. All the grains grown in the plots are also grown in single rows and usually in another field. Each row is two rods long and 200 grains are sown in a row. The objects of sowing them thus are: (1) To give information as to germination; (2) To give opportunity for convenient comparison as to strength of stem, rust, height of grain, etc., and (3) To furnish supplies for exhibition purposes without interference with the crop grown upon the measured plot.

(*a*) *Cereals on Small Plots.*

Heretofore nearly all of these grains were grown upon low lying fields where they were much subject to injury from rust. We also consider that where experiments have been grown upon the same plot for three years, an unevenness in the quality of the soil arises from the variations in the crops grown each year, and therefore it becomes necessary to change the plots. We selected for this purpose an elevated field with soil less variable than is usually found upon this farm, and which had been evenly cropped during previous years. It grew a crop of oats in 1889. In the spring of 1890 farm-yard manure was applied at the rate of 15 loads per acre, and a crop of rape was grown upon it the same autumn, which was pastured off by lambs. No manure of any kind has since been applied. It may be well to mention here that all the yields per acre which are given and which are comprised under this heading are estimates based upon the yields of the small plots.

1. Barley. Comparative Test of 67 Varieties.

In 1892, 67 varieties of barley were grown. The plots were in size one one-hundredth of an acre each. The grain was all sown April 19th. The seed was sown broadcast at the rate of two bushels per acre. The ground was then harrowed and rolled. Table I gives the characteristics relating to the 67 varieties grown during 1892. Tables II, III, IV and V give the yields of the varieties grown for four years, three years, two years and one year respectively. Table VI gives the yields per acre of the six varieties of hulless barley grown for two years past. The varieties are arranged in each table according to the average yields of grain per acre for the period indicated.

It will be noticed (Table I.) that the period of maturing extended from July 21st, until August 10th, a period of 21 days. If the Hulless varieties are not included it extended from July 28th to August 10th. It is worthy of note that the eight varieties which came first to maturity, not including the Hulless, gave an average yield of 47 bushels per acre in 1892, and they were all six-rowed. The eight varieties which came last to maturity gave an average yield of 45 bushels per acre, and they were all two-rowed. Hence it is fair to conclude that the two-rowed varieties as a rule mature later than the six-rowed.

It will also be noticed that the greatest length of plant with any variety is 49 inches, and the shortest length of the same is 31 inches, a difference of 18 inches. The Pfanen from Sweden is possessed of the longest straw, and it also stands up more than ordinarily well.

TABLE I. Characteristics of sixty-seven varieties of Barley grown in 1892.

Varieties.	Country obtained from.	Number of years grown at O. A. C.	Date of maturity.	Length of plant.	Amount of straw lodged.	Nature of head.
				inches.		
1 Mandscheuri	Russia	4	July 30	40	Medium.	6-rowed.
2 French Chevalier	France	4	Aug. 3	41	Large	2 "
3 Empress	England	4	" 7	41	Medium.	2 "
4 Scotch Improved	Ontario	4	July 29	41	Large	6 "
5 Selected Chevalier	England	4	Aug. 3	42	"	2 "
6 Thanet	"	4	" 3	40	"	2 "
7 Improved Cheyne	"	4	" 3	41	"	2 "
8 Oderbrucker	Germany	4	July 29	43	Medium.	6 "
9 Kalina	Sweden	4	Aug. 3	38	"	2 "
10 Hallett's Pedigree	Germany	4	" 7	39	None	2 "
11 Imperial	France	4	" 6	40	"	2 "
12 Peerless White	England	4	" 5	42	Medium.	2 "
13 Phœnix	Germany	4	" 2	41	"	2 "
14 Improved Golden Melon	England	4	" 10	40	Small	2 "
15 Improved Beardless	"	4	" 5	46	"	2 "
16 German Golden Drop	Germany	4	" 3	39	Medium.	2 "
17 Common six-rowed	Ontario	4	July 29	41	"	6 "
18 Two-rowed Italian	France	4	Aug. 3	41	Small	2 "
19 Early Black	"	4	" 1	33	None	6 "
20 English Golden Drop	England	4	" 6	40	Large	2 "
21 Kinnakulla	Sweden	4	" 3	46	Small	2 "
22 English Malting	Ontario	4	" 7	39	Medium.	2 "
23 Improved Imperial	Germany	4	" 3	42	Large	6 "
24 Cheyne	"	4	" 7	41	Small	2 "
25 Probsteier	"	4	" 3	41	Medium.	2 "
26 Scotch Chevalier	Scotland	4	" 7	41½	Large	2 "
27 Invel	Germany	4	" 7	47	"	2 "
28 Two-rowed Spreading	France	4	" 3	37	None	2 "
29 Golden Melon	Germany	4	" 7	41	Large	2 "
30 Pfanen	Sweden	4	" 3	49	Small	2 "
31 Carter's Prize Prolific	England	4	" 6	40	Large	2 "
32 Italian Rice	Germany	4	" 2	31	None	2 "
33 Beardless	Ontario	4	" 8	43	Medium.	2 "
34 Annats	Scotland	4	" 8	39	Large	2 "
35 Scholey's Chevalier	Germany	4	" 5	41	"	2 "
36 Emperor	"	4	" 7	39	Large	2 "
37 Dutch	"	4	" 8	41	Medium.	2 "
38 French Chevalier	France	3	" 5	38	"	2 "
39 Australian	Germany	3	" 5	43	"	2 "
40 Italian	Italy	3	" 2	37	Large	2 "
41 Chevalier	New Zealand	3	" 7	45	"	2 "
42 Early Minting	England	3	" 7	40	Medium.	2 "
43 Cape	New Zealand	3	" 1	.....	"	6 "
44 Mensury	Ontario	3	" 1	40	"	6 "
45 Diamond	Germany	3	" 5	38	Small	2 "
46 Very Early Lapland	Russia	3	July 28	39	Medium.	6 "
47 California Brewing	United States	2	" 30	40	Large	6 "
48 Duckbill	Ontario	2	Aug. 4	46	None	2 "
49 Salzer's Californian Prolific	United States	2	" 5	47½	"	2 "
50 Mansury	"	2	" 1	37	Small	6 "
51 Carter's Goldthorpe	England	2	" 8	45	Medium.	2 "
52 Six-rowed Baxter's Improved	Ontario	2	July 29	37	"	6 "
53 California Chevalier	United States	2	Aug. 5	36	"	2 "
54 Highland Chief	"	2	" 9	38	Small	2 "
55 Imperial six-rowed	Ontario	2	July 29	39	Large	6 "
56 Carter's Prize Prolific	England	2	Aug. 8	37	Small	2 "
57 Martin West	United States	2	" 2	37	"	2 "
58 Gold Foil Hansfords	"	1	" 3	41	Large	2 "
59 Two-rowed Canadian	Ontario	1	" 3	45	Small	2 "
60 Winter Barley	Germany	1	.....	.....	Large	6 "
61 Selected Canadian Thorpe	Ontario	1	Aug. 5	46	Small	2 "
62 Hungarian	Hungary	3	" 2	33	Medium.	6 "
63 Guymalaya	Sweden	3	" 2	38	"	6 "
64 Black Hulless	Ontario	3	July 30	30	Large	6 "
65 Large Skinned	France	3	Aug. 2	33	"	2 "
66 Three-rowed	Germany	3	July 25	35	"	6 "
67 Skinless	Australia	3	" 21	28	None	6 "

The eight varieties possessed of the longest straw, gave an average yield of 52.3 bushels per acre, and those possessed of the shortest straw, 49.2 bushels per acre. This would in some sense point to the conclusion that there is an intimate relation between length of plant and good yields. The eight varieties with greatest length of plant were two-rowed, hence it would seem fair to conclude that the two-rowed varieties reach a greater average height than the six-rowed.

TABLE II. Yields of thirty-seven varieties of Barley for four years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre, (bushel, 48 lb).	
	1892.	Average 3 years. 1890-91-92.	1892.	Average 4 years. 1889-90-1-2.	1892.	Average 4 years. 1889-90-1-2.
	lb.	lb.	tons.	tons.	bushels.	bushels.
1 Mandscheuri	50.5	50.8	1.6	1.8	53.3	57.6
2 French Chevalier	51.3	52.0	2.0	1.8	51.7	54.0
3 Empress	51.6	52.0	2.0	2.0	49.0	52.8
4 Scotch Improved	53.5	52.3	1.2	1.3	47 6	51.3
5 Selected Chevalier	52.0	51.8	2.5	2.0	55.4	50.8
6 Thanet	52.3	52.0	2.3	1.9	53.7	50.5
7 Improved Cheyne	52.1	52.4	2.1	2.0	50.3	50.3
8 Oderbrucker	54.1	53.9	1.3	1.5	42.1	49.9
9 Kalina	53.4	52.6	1.8	1.8	49.4	49.9
10 Hallett's Pedigree	51.4	52.8	1.6	1.7	39.8	49.7
11 Imperial	52.0	52.3	1.9	2.0	44.0	48.5
12 Peerless White	53.0	53.2	2.1	1.8	52.3	48 2
13 Phœnix	53.8	53.0	2.1	1.8	54.4	48.0
14 Improved Golden Melon	52.3	52.3	1.5	1.7	38.0	47.8
15 Improved Beardless	52.3	51.6	2.4	2.0	55.2	47.8
16 German Golden Drop	52.3	53.2	2.1	2.0	47.2	47.1
17 Common six-rowed	53.3	53.1	1.2	1.3	42.8	46.7
18 Two-rowed Italian	52.6	52.5	1.9	1.9	48.0	45.4
19 Early Black	49.8	50.1	1.4	1.5	46.2	45.1
20 English Golden Drop	51.9	51.8	2.3	1.9	51.0	44.8
21 Kinnakulla	51.3	50.6	2.3	1.8	58.6	44.6
22 English Malting	52.1	52.5	2.3	1.9	51.5	44.2
23 Improved Imperial	47.0	46.4	2.2	2.0	36.6	44.0
24 Cheyne	51.1	51.9	1.7	1.7	34.9	42.6
25 Probsteier	53.1	52.7	2.0	1.7	50.2	42.3
26 Scotch Chevalier	52.0	52.9	2.2	1.6	49.6	42.1
27 Invel	50.8	51.1	2.7	1.8	54.2	42.0
28 Two-rowed Spreading	49.4	49.8	1.6	1.5	43.6	41.8
29 Golden Melon	51.4	52.1	2.1	1.6	48.4	41.1
30 Pfanen	50.5	51.2	2.5	1.7	57.3	41.0
31 Carter's Prize Prolific	52.5	52.7	2.3	2.1	40.8	40.5
32 Italian Rice	51.1	50.5	2.1	1.6	54 1	40.3
33 Beardless	51.9	51.4	2.0	1.8	46.0	40.2
34 Annats	49.6	51.0	2.8	1.8	44.5	39.5
35 Scholey's Chevalier	48.5	50.7	2.6	1 8	45.2	38.2
36 Emperor	49.0	51.1	2.3	1 9	40.5	37.0
37 Dutch	49.8	47.5	2.4	1.7	47.4	34.8
Average	51.53	51.67	2.04	1.78	47.97	45.47

It will be observed that the Mandscheuri variety, imported from Russia, has given the highest yield among 37 varieties grown for four years. It has given an average yield of 57.6 bushels per acre during that time, and in 1892 a yield of 53.3 bushels per acre. The Kinnakulla stands first among these varieties in point of yield in 1892. It was imported from Sweden. It is a two-rowed variety, is quite tall and unusually stiff in the straw, and is withal a handsome variety which has been constantly improving since it was first imported. The Duckbill variety, grown for two years at this station, bears a close resemblance to the Kinnakulla, but while the yield of the latter was 58.6 bushels per acre, that of the former was but 47.8 bushels.

The average yield per acre of the two-rowed varieties for four years, was 44.8 bushels, and of the six-rowed 49.1 bushels. The average weight per bushel was 51.8 lb. with the former, and 51.1 lb. with the latter.

The Oderbrucker, a six-rowed variety, imported from Germany, gave the heaviest average weight per measured bushel. It weighed 53.9 lb., has eighth place in point of yield, is possessed of good length of straw, and is early maturing, but has only medium strength of straw.

TABLE III. Yields of nine varieties of Barley for three years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre, (bushel, 48 lb).	
	1892.	Average 3 years. 1890-91-92.	1892.	Average 3 years. 1890-91-92.	1892.	Average 3 years. 1890-91-92.
	lb.	lb.	tons.	tons.	bushels.	bushels.
38 French Chevalier	49.5	52.4	2.5	2.1	52.3	**55.6**
39 Australian	51 5	51.5	2.2	1.9	52.4	**53.1**
40 Italian	52.6	52.3	2.1	2.0	56.2	**51.7**
41 Chevalier	50.6	52.5	2.7	2.1	48.2	**51.7**
42 Early Minting	51.3	51.8	2.2	2.0	41.9	**51.5**
43 Cape	43.8	46.6	1.6	1.4	50.0	**49.8**
44 Mensury	51.1	51.4	1.3	1.3	44.3	**49.0**
45 Diamond	51.0	52.0	2.2	1.7	48.6	**44.4**
46 Very Early Lapland	47.0	47.3	1.1	1.2	43.7	**41.0**
Average	49.82	50.87	1.99	1.74	48.62	**49.76**

Two lots of French Chevalier barley were imported from France, one of which has been grown for four years, and stands second in the list among 37 varieties in point of yield. The other has been grown for three years, and stands first in the list of nine varieties grown. These were probably from the same variety originally, grown in different provinces of France, and the similarity in the results tends to confirm the view that this is a productive variety. It is two-rowed, and is possessed of good average properties. The yield for the past three years was 55.6 bushels per acre.

TABLE IV. Yields of eleven varieties of Barley for two years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre, (bush. 48 lb.)	
	1892.	Average 2 years 1891-2.	1892.	Average 2 years 1891-2.	1892.	Average 2 years 1891-2.
	lb.	lb.	tons.	tons.	bush.	bush.
47 California Brewing	44.3	44.5	1.7	1.7	61.5	**64.2**
48 Duckbill	52.1	52.2	1.8	2.0	47.8	**61.5**
49 Salzer's Californian Prolific	52.0	52.9	2.0	1.8	47.9	**60.2**
50 Mansury	48.5	49.3	1.6	1.6	48.1	**60.0**
51 Carter's Goldthorpe	51.1	51.2	2.3	2.1	51.7	**59.5**
52 Six-rowed Baxter's Improved.	53.8	53.0	1.3	1.5	43.5	**58.2**
53 California Chevalier	52.1	51.6	2.2	2.2	56.0	**57.8**
54 Highland Chief	51.3	51.6	1.4	2.0	32.5	**56.7**
55 Imperial six-rowed	53.4	52.6	1.1	1.4	41.0	**55.8**
56 Carter's Prize Prolific	52.0	52.0	1.7	1.9	46.2	**53.4**
57 Martin West	54.8	54.8	1.8	1.7	44.6	**53.2**
Average	51.40	51.43	1.72	1.81	47.62	**58.23**

The California Brewing which stands at the head of the list in table IV has given the highest yield among sixty-seven varieties grown in 1892. The yield was 61.5 bushels per acre, but the weight, which was only 44.3 lb. per measured bushel, will preclude it from taking a place along with malting varieties. It is a six-rowed barley, and it is weak in the straw. The Carter's Prize Prolific, which has thirty-first place among thirty-seven varieties grown for four years, has tenth place among the eleven varieties grown for two years. The seed of this variety from which the lot included in the table was grown, was imported from England in 1891.

TABLE V. Yields of four varieties of Barley for 1892.

Varieties.	Weight per measured bushel.	Straw per acre.	Grain per acre, (bush. 48 lb.)
	lb.	tons.	bush.
58 Gold Foil Hansfords	50.9	2.7	**50.0**
59 Two-rowed Canadian	53.4	2.1	**46.4**
60 Winter Barley	48.8	2.1	**44.8**
61 Selected Canadian Thorpe.	51.0	2.0	**43.8**

The two-rowed Canadian and the Selected Canadian Thorpe, which were obtained from Ontario seedsmen, bear a close resemblance to one another. They are both two-rowed varieties, and are strong in the straw. One variety in this table, which came to us from Germany labelled "Winter barley," and which has been grown at the station for three years, seems to be improving in hardihood, and may yet be found worthy the attention of the farmer.

TABLE VI. Yields of six varieties of Hulless Barley for three years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre, (bush. 60 lb.).	
	1892.	Average 3 years '90-91-92.	1892.	Average 3 years '90-91-92.	1892.	Average 3 years '90-91-92.
	lb.	lb.	tons.	tons.	bush.	bush.
62 Hungarian	.....	.....	1.7	1.7	44.6	**46.9**
63 Guymalaya	59.4	58.9	2.0	2.0	46.2	**42.4**
64 Black Hulless	62.9	64.6	1.8	1.6	48.7	**42.2**
65 Large Skinned	60.8	60.4	1.5	1.4	27.5	**28.9**
66 Three-rowed	58.0	60.0	1.4	1.2	34.0	**27.4**
67 Skinless	61.0	61.0	1.2	1.1	36.4	**26.9**
Average	60.42	60.98	1.6	1.5	39.57	**35.78**

Several of these varieties are possessed of considerable promise. It will be observed they weigh so heavily that 60 lb. is the standard per measured bushel. They are all light colored, except the Black Hulless variety, which is possessed of some notoriety in several parts of Ontario. It is very weak in the straw. The Hungarian and Guymalaya, which stand first and second in the list respectively, possess straw which is considerably stronger. These two varieties are deserving of considerable attention if grown for feeding purposes.

2. Barley. Different Dates of Seeding.

The following table is a part of an experiment conducted simultaneously with peas, spring wheat and oats, to ascertain the results from sowing them at different dates. The barley was sown in duplicate plots in 1891 and 1892 respectively, and each of the two plots contained a different variety. The plots were one one-hundred-and-sixtieth of an acre in size, and two bushels of seed were used per acre, sown broadcast.

Table vii. Comparative yields of Barley from different dates of seeding.

Dates of seeding.	Weight per measured bushel.			Straw per acre.			Yield of grain per acre.		
	1891.	1892.	Average	1891.	1892.	Average	1891.	1892.	Average
	lb.	lb.	lb.	tons.	tons.	tons.	bush.	bush.	bush.
April 22nd	50.3	47.0	48.7	1.17	.9	1.04	29.5	22.7	26.1
May 1st	48.6	45.3	47.0	1.39	1.0	1.20	37.8	18.0	27.9
May 9th	47.1	44.9	46.0	1.33	1.0	1.17	37.8	16.5	27.2
May 18th	45.5	39.9	42.7	.91	1.0	.96	24.8	11.7	18.3
May 26th	44.2	39.6	41.9	.90	1.3	1.10	17.7	5.9	11.8
June 6th	42.4	Failure.	.....	.96	Failure.	.....	17.4	Failure.	.....

It will be observed that the best yields were obtained from the second and third seedings in 1891 and from the first seeding in 1892. The crop from the last seeding in 1892 was of no value. The weight in each instance decreases with every seeding during both years. The soil in which tests that relate to different dates of seeding were made was not of a very suitable character, hence the low yields in each instance.

3. Peas. Comparative Test of Sixty-One Varieties.

The plots, upon which the sixty-one varieties were grown in 1892, were one one-hundredth of an acre in size. The seed of each variety was sown broadcast April 23rd. They were sown in quantities, varying from two to four bushels per acre, according to the character of the peas. After they were sown the ground was harrowed and rolled. Table viii gives the characteristics and yields of the fifty-seven varieties which germinated successfully.

Of the 61 varieties grown in 1892, the Princess Royal gave the largest yield, viz: 46.2 bushels per acre, and the Early Racehorse the heaviest weight per measured bushel, viz: 62.8 lb. Owing to imperfect germination of the seed in 1891, the results for that year were considered too incomplete to be of any especial value. In 1890, 20 varieties were grown. The six varieties which gave the highest average yield for two years, viz, 1890 and 1892, are as follows:

Name of variety.	Weight per measured bushel. lbs.	Yield per acre. bush.
Prussian Blue	62.7	43.4
Black Eyed Marrowfat	61.2	39.9
Princess Royal	60.7	39.2
White Eyed Marrowfat	62.1	38.7
Multipliers	61.8	37.9
Early Racehorse	63.5	35.9

The Mummy pea, popular in many parts of Ontario, gave an average of 33.7 bushels per acre for the two years mentioned, and an average weight of 63.8 lb. per measured bushel.

TABLE VIII. Characteristics and yields of fifty-seven varieties of Peas.

	Varieties.	Country obtained from.	Date of maturity.	Weight per measured bushel.	Yield of straw per acre.	Yield of grain per acre.
				lb.	tons.	bush.
1	Princess Royal	England	Aug. 15..	57.75	1.54	46.20
2	Early Britain	"	" 15..	59.50	1.72	44.38
3	Blue	New Zealand	" 15..	60.75	1.38	43.07
4	Prussian Blue	Ontario	" 11..	61.75	1.90	41.77
5	White Wonder	New Zealand	" 12..	61.50	1.28	40.63
6	Black Eyed Marrowfat	Ontario	" 17..	60.25	1.60	39.07
7	Field	New Zealand	" 12..	61.75	1.35	39.17
8	Brown	"	" 13..	57.00	2.24	38.80
9	Mummy	Ontario	" 14..	61.75	2.01	38.75
10	Tall White Marrowfat	"	" 13..	60.50	1.94	37.72
11	Canada Cluster	"	" 13..	60.75	2.13	35.83
12	Early Racehorse	England	" 12..	62.75	1.43	35.57
13	Cleveland's Advance	Ontario	" 13..	59.75	1.59	35.22
14	Early June	"	" 13..	62.13	1.40	35.10
15	Multiplier	"	" 21..	61.00	1.69	34.50
16	Royal Dwarf Marrowfat	"	" 15..	59.25	1.60	34.22
17	No. 10 Rennie	"	" 12..	61.25	1.54	34.12
18	McLean's Advance	"	" 9..	54.25	.93	34.02
19	White Eyed Marrowfat	"	" 15..	61.00	1.44	33.55
20	Crown	"	" 12..	60.25	1.55	33.33
21	Scotchman	United States	" 19..	61.75	2.08	33.07
22	Golden Vine	Ontario	" 14..	61.00	1.65	32.68
23	Centennial	"	" 14..	60.13	1.47	31.82
24	Canada Field	United States	" 14..	60.50	1.60	31.67
25	Sword	"	" 12..	60.75	1.42	29.38
26	Prince Albert	Ontario	" 18..	61.13	1.94	29.22
27	Sexton's Alpha	United States	" 9..	54.50	1.44	28.70
28	Telephone	Ontario	" 9..	53.50	1.37	28.60
29	Perfection White	England	" 11..	59.75	1.22	28.55
30	Champion of England	Ontario	" 13..	54.75	1.57	28.48
31	Early Maple	England	" 19..	60.00	1.85	28.33
32	Prince of Wales	Ontario	" 9..	52.13	1.15	27.08
33	Philadelphia Extra Early	United States	July 30..	59.00	.70	25.15
34	Oakshot Field Pea	England	Aug. 19..	52.50	1.39	24.58
35	Veitche's Perfection	"	" 17..	52.50	1.59	23.55
36	Striped Wisconsin Blue	Ontario	" 17.	61.75	1.77	22.82
37	Telegraph	"	" 2.	58.13	1.08	22.68
38	Cleveland's Rural New Yorker	"	July 23..	62.50	.69	21.88
39	McLean's Little Gem	"	" 29..	54.13	.68	20.78
40	Stratagem	"	Aug. 11.	53.00	1.30	20.73
41	Glory	England	" 12..	61.50	1.73	20.52
42	Cleveland's Alaska	Ontario	July 25..	59.50	.61	19.85
43	Pride of the North	"	Aug. 9..	58.13	1.02	19.48
44	Sugar	"	" 11..	58.25	.59	18.80
45	Hero of Reading	England	" 2..	59.00	1.23	18.33
46	Selected Maple	"	" 3..	60.25	.65	18.28
47	Tom Thumb	Ontario	July 22..	61.50	.55	16.77
48	Prince Albert	"	Aug. 12..	60.50	1.38	16.67
49	Sweet Jessie	England	July 30..	61.50	.84	16.30
50	Potter	Ontario	Aug. 6..	60.25	.92	15.93
51	British Queen	"	" 11..	52.50	1.40	15.83
52	Grass	"	.....	60.75	.....	14.98
53	Yorkshire Hero	"	Aug. 6..	52.50	1.07	12.82
54	Anticipation	"	" 10..	53.75	.58	12.40
55	Earliest-of-all Blue	England	" 2..	61.25	.41	11.47
56	Blue Peter	Ontario	July 24..	57.00	.51	9.85
57	American Wonder	"	" 23..	52.50	.39	7.08

Four varieties of those sown in 1892 were complete failures, owing to a lack of germination. Several of the smallest-yielding sorts are table varieties, which ripen early and have a short habit of growth of straw.

4. Peas. Different Dates of Seeding.

The following table is a part of an experiment conducted simultaneously with barley, spring wheat and oats, to ascertain the results from sowing them at different dates. The peas which have been grown but for one year were sown in duplicate plots, and each of the two contained a different variety. The plots were one one-hundred-and-sixtieth of an acre in size, and two and a half bushels of seed were used per acre, sown broadcast.

Table ix. Comparative yield of Peas from different dates of seeding.

Date of seeding.	Weight per measured bushel.	Straw per acre.	Yield of grain per acre.
	lb.	tons.	bush.
April 22nd	57.9	1.3	19.5
May 1st	59.2	1.4	21.1
May 9th	60.7	1.2	21.8
May 18th	61.0	1.4	18.5
May 26th	61.2	1.1	9.7
June 6th	61.5	1.3	5.2

It will be noticed that the highest yields were obtained from the peas sown on May 9th, at the third seeding. This would seem to imply that it is not so important that peas should be sown early as in the case of some other varieties of grain. But from only one year's experience it would not be safe to draw conclusions of a positive character. It is not a little remarkable, however, to note the gradual increase in the weight of the peas per bushel with each successive seeding, which is just the opposite of what we find to be the case with the other varieties of grain.

5. Spring Wheat. Comparative Test of 63 Varieties.

In 1892, 63 varieties of spring wheat were grown. The plots were one one-hundreth of an acre in size. The grain was sown April 23rd. It was sown broadcast by hand and at the rate of two bushels per acre. The ground was then harrowed and rolled. Table x gives the characteristics of the 63 varieties.

Tables xi, xii, xiii, and xiv give the respective yields of the varieties grown for four, three and two years, and also for one year. The names of the varieties are arranged according to the average yield during each of the respective periods.

It will be noticed (Table x) that the period of maturing extended from August 9th to August 19th. It is worthy of note that the 12 varieties which came first to maturity gave an average yield of 14.2 bush. per acre in 1892, while the 7 varieties which came last to maturity gave an average yield of 19.4 bush. per acre. All of the later-maturing varieties were imported, while in the list of early-maturing varieties 5 Canadian sorts are included. When the four earliest-maturing Canadian varieties are compared with the four latest-maturing kinds, the average yield per acre is in favor of the latter to the extent of 4.3 bushels. It would seem, therefore, judging from the experience of the past season, that early ripening in varieties of spring wheat is not to be specially sought for. This view is confirmed in our experience of growing spring wheat in 1891 and also in 1890. In the former year, while the 6 earliest-yielding sorts gave an average of 29 bushels, the latest-yielding varieties gave an average of 24 bushels, and in 1890, while 7 of the earliest-ripening sorts gave an average of 14.2 bushels, 8 of the latest-maturing kinds gave an average of 16.7 bushels.

TABLE X. Characteristics of sixty-three varieties of Spring Wheat.

Varieties.	Country obtained from.	Number of years grown at Ont. Agr'l College.	Date of maturity.	Length of plant.	Amount of straw lodged.	Amount of rust.	Nature of head.	Color of grain.
			Aug.	in.				
1 Herison Bearded	France ..	4	11	43	Medium	Slight .	Bearded	Red.
2 Pringle's Champion	Germany .	4	11	47	"	" .	"	"
3 Saxonka	Russia ...	4	12	44	"	" .	"	"
4 Holben's Improved	Germany .	4	16	47	Small ..	" .	Bald ...	"
5 Bart Trimenia	Greece ...	4	13	42	" ..	Trace ..	Bearded	"
6 Summer	Germany .	4	11	40	" ..	Medium	"	"
7 Ordinary Bearded March	France ..	4	13	42	" ..	"	"	"
8 Konisberg	Russia ...	4	13	44	"	Trace ..	"	"
9 Odessa Ghirka	" ...	4	14	45	Medium	Medium	Bald ...	"
10 Nenhert	Germany .	4	16	50	Small ..	Slight .	" ...	"
11 King Bartigen	" .	4	13	44	Medium	Large ..	Bearded	"
12 Dantzic	Russia ...	4	12	42	"	Medium	"	"
13 Bearded Red	France ...	4	10	45	Small ..	"	"	"
14 April Bearded Red	England .	4	11	45	Medium	"	"	"
15 Red Bearded March	France ..	4	10	48	"	"	"	"
16 Ordinary March	"	4	10	43	"	"	"	"
17 March Debrie	" ..	4	14	42	Small ..	"	Bald ...	White.
18 Chidham White	Germany .	4	17	43	Medium	Large ..	" ...	"
19 French Summer	France ..	4	11	44	"	Medium	" ...	Red.
20 Large Flag	" ..	4	10	40	None ..	"	" ...	White.
21 Lonzella White	" ..	4	16	40	Medium	Large ..	" ...	Red.
22 Hickling's March White	" ..	4	13	50	Small ..	Medium	" ...	"
23 Red Fern	Ontario ..	3	11	49	Medium	Slight .	Bearded	"
24 White Russian	" ..	3	13	45	Large .	" .	Bald ...	White.
25 White Fyfe	" ..	3	12	45	None ..	Trace ..	" ...	"
26 Red Fyfe	" ..	3	12	47	Medium	" ..	" ...	Red.
27 Wild Goose	" ..	3	11	52	"	Slight .	Bearded	"
28 Mountain	Hungary .	3	17	46	Small ..	" .	Bald ...	"
29 Triumph	Ontario ..	3	10	40	Large ..	Medium	" ...	"
30 Colorado	" ..	3	10	43	Small ..	"	Bearded	"
31 Sorentino	Italy	3	15	44	" ..	Large ..	"	"
32 Medeah	Africa ...	3	12	51	Medium	Trace ..	"	"
33 Kubanka	Russia ...	3	11	42¼	"	Slight .	"	"
34 Grecian	" ...	3	15	47	"	Medium	"	"
35 Algiers	Africa ...	3	11	45	Small ..	"	"	"
36 Ladoga	Ontario ..	3	10	42	Medium	"	"	"
37 Atalan k	Greece ...	3	12	47	"	"	"	"
38 Paros	" ...	3	12	40	Large ..	Slight .	"	White.
39 Neapel	Italy	3	10	50	None ..	Medium	"	Red.
40 Voto	Greece ...	3	14	44	Medium	"	"	White.
41 Square Head	Sicily	3	10	48	Small ..	"	Bald ...	Red.
42 March White	California	3	9	36	Large ..	"	"	White.
43 African	Africa ...	3	13	42	Small ..	Large .	"	"
44 McCarlin	Ontario ..	2	14	52	Medium	Slight .	Bearded	"
45 Rio Grande	" ..	2	12	48	"	" .	"	"
46 Manitoulin	" ..	2	12	45	None ..	Trace ..	Bald ...	Red.
47 Okanagan Valley Velvet Chaff	U. S.....	2	14	45	Medium	" ..	" ...	"
48 Saskatchewan Red Fyfe	Ontario ..	2	14	42½	Small ..	" ..	" ...	"
49 Salzer's Assiniboia Fyfe	U. S.....	2	13	42	" ..	" ..	" ...	White.
50 Washington	"	2	13	52	None ..	Slight .	Bearded	"
51 Pringle's Defiance	Germany .	2	13	40	" ..	Trace ..	Bald ..	"
52 Anglo Canadian	England .	2	10	46	Small .	Medium	Bearded	"
53 Bearded Manitoba	Ontario ..	2	10	32	Large ..	Large .	"	Red.
54 Lost Nation	" ..	1	11	41	" ..	Trace ..	Bald ..	"
55 Wellman Fyfe	U. S.....	1	13	46	Medium	" ..	" ..	"
56 Velvet Chaff Blue Stem	"	1	14	46	Small ..	None...	" ..	"
57 Manitoba Red	Ontario ..	1	11	45	Medium	Trace ..	" ..	"
58 Hayne's Blue Stem	U. S.....	1	14	47	Small ..	" ..	" ..	"
59 New York Spring Wheat	"	1	14	43	Medium	Slight .	Bearded	"
60 The Mars	Ontario ..	1	11	48	None ..	Trace ..	Bald ..	"
61 Dakota Marvel	U. S.. .	1	14	46	Medium	" ..	" ..	"
62 Magyar	Ontario ..	1	13	47	Small ..	Medium	" ..	"
63 Campbell's White Chaff	" ..	1	10	40	Medium	Slight .	" ..	White.

It will also be observed that the 7 varieties possessed of greatest length of plant, viz. : 50 inches and over, gave an average yield of 19.9 bushels per acre in 1892, and the 9 varieties possessed of the shortest length of plant, viz., 40 inches and less, gave an average yield of 12.9 bushels per acre. This would justify the conclusion that in growing spring wheat there is an intimate relation between the length of the plant and large yields.

Of the 63 varieties in the above table 31 were bald and 32 bearded. The bald sorts weighed 56.93 lb. per measured bushel and yielded 18.64 bushels per acre ; the bearded varieties weighed 57.83 lb. per measured bushel and yielded 19.54 bushels per acre.

The Lost Nation, an old variety well known in Ontario, gave the highest yield the past season, viz., 30.8 bush. per acre. The McCarlin variety, well known in Eastern Ontario, came second with a yield of 29.7 bush., and the Saxonka imported by the station four years ago from Russia came third giving a yield of 29.6 bushels.

TABLE XI. Yields of twenty-two varieties of Spring Wheat for four years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre (bush. 60 lb.)	
	1892.	Average 3 years 1890-91-92.	1892.	Average 3 years 1890-91-92.	1892.	Average 4 years. 1889 90-91-92.
	lb.	lb.	tons.	tons.	bush.	bush.
1 Herison Bearded	61.3	63.5	2.0	1.7	24.0	**26.0**
2 Pringle's Champion	60.5	60.8	2.1	1.8	23.7	**23.6**
3 Saxonka	60.5	60.2	2.4	1.5	29.6	**22.6**
4 Holben's Improved	58.0	59.0	2.0	1.7	22.6	**22.0**
5 Bart Trimenia	62.3	62.8	1.7	1.5	28.2	**21.8**
6 Summer	54.0	57.6	1.4	1.6	15.1	**20.7**
7 Ordinary Bearded March	55.5	58.1	2.0	1.7	22.1	**20.6**
8 Konisburg	61.8	62.1	1.5	1.5	19.8	**20.4**
9 Odessa Ghirka	57.0	59.9	2.1	1.6	17.2	**20.2**
10 Nenhert	56.0	55.0	2.0	1.6	28.4	**18.6**
11 King Bartigen	55.5	57.7	2.5	1.6	22.4	**18.4**
12 Dantzic	58.5	59.7	1.8	1.4	19.7	**17.6**
13 Bearded Red	56.0	58.3	1.4	1.3	17.1	**17.0**
14 April Bearded Red	58.3	56.4	2.1	1.7	20.6	**16.7**
15 Red Bearded March	55.3	57.3	1.4	1.1	18.1	**16.7**
16 Ordinary March	55.0	55.9	1.7	1.3	16.8	**16.6**
17 March Debrie	54.5	55.9	1.7	1.8	17.2	**15.9**
18 Chidham White	53.3	55.2	2.0	1.5	16.2	**15.9**
19 French Summer	55.3	56.2	1.7	1.4	13.6	**15.6**
20 Large Flag	53.5	55.3	1.1	.9	11.0	**12.2**
21 Lonzella White	50.0	51.9	1.7	1.5	9.3	**11.0**
22 Hickling's March White	50.0	51.1	1.7	1.5	9.2	**10.8**
Average	56.5	57.7	1.8	1.5	19.2	**18.2**

The Herison Bearded still heads the list among 22 varieties grown for 4 years. It stands fairly stiff in the straw and during all that time has been almost entirely free from rust. Both the heads and the grain are somewhat uneven in size. Pringle's Champion produces a fairly strong straw, has a well-shaped head, is not much liable to rust, and produces a fine sample of grain. The 22 varieties grown for four years gave an average yield of 19.2 bushels per acre in 1892. Of these the 5 which gave the highest yields for 4 years made an average of 23 bushels per acre and the 5 which gave the lowest yields 13.1 bushels.

TABLE XII. Yields of twenty-one varieties of Spring Wheat for three years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre, (bush. 60 lb.)	
	1892.	Average 3 years '90-91-92.	1892.	Average 3 years '90-91-92.	1892.	Average 3 years '90 91-92.
	lb	lb	tons.	tons.	bush.	bush.
23 Red Fern	62.0	61.7	2.2	2.0	27.8	**31.4**
24 White Russian	59.5	59.2	2.1	1.8	27.1	**28.7**
25 White Fyfe	61.0	60.5	1.5	1.4	21.5	**26.3**
26 Red Fyfe	60.0	60.2	1.7	1.7	25.1	**25.4**
27 White Goose	59.6	61.0	1 8	1.8	28.0	**25 0**
28 Mountain	58.6	58.6	1.9	1.4	25.1	**22.3**
29 Triumph	57.5	59.6	1.5	1.3	15.7	**22.2**
30 Colorado	58.5	60.5	1.4	1.3	19.3	**22 2**
31 Sorentino	58.5	59.7	1.5	1.3	19.2	**20.8**
32 Mediah	61.3	61.4	1.7	1.2	23.0	**20.4**
33 Kubanka	60.0	....	1.7	...	19.9	**20.4**
34 Grecian	57.8	57.4	1.6	1.5	15.0	**20.1**
35 Algiers	56.5	58.2	1.6	1.4	18.4	**19.7**
36 Ladoga	54.C	57.2	1.5	1.4	15.3	**19.3**
37 Atalank	56.0	57.4	1.5	1.3	15.8	**18.9**
38 Paros	55.3	56.5	1.6	1.4	14.5	**18.1**
39 Neapel	51.5	54.3	1.6	1.5	13.8	**17.4**
40 Vota	54.5	56.5	1.1	1.3	10.1	**17.2**
41 Square Head	51.5	53.6	1.2	1.2	7.9	**16.2**
42 March White	48.3	55.8	1.3	1.0	9.7	**15.6**
43 African	....	....	.9	.9	4.0	**13.5**
Average	57.09	58.38	1.57	1.41	17.91	**20.05**

The Red Fern variety stands at the head of the list of the 21 kinds grown for three years. It also heads the list in weight per measured bushel in 1892 and during the two previous years. This variety is well known in many parts of Ontario, and seems to retain its good reputation even when compared with newer introductions. The Colorado, about which much has been said during recent years, has eighth place in the list. It is early, stands well and has medium power to withstand rust. The millers differ much in their views regarding its value for their uses.

TABLE XIII. Yields of ten varieties of Spring Wheat for two years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre, (bush. 60 lb.)	
	1892.	Average 2 years 1891-92.	1892.	Average 2 years 1891-92.	1892.	Average 2 years 1891-92.
	lb	lb	tons.	tons.	bush.	bush.
44 McCarlin	60.8	59.9	1.9	1.8	22.4	**29.7**
45 Rio Grande	60.1	60.6	1.8	1.8	20.5	**28.4**
46 Manitoulin	60.8	60.6	1.3	1.2	24.1	**26.8**
47 Okanagan Valley Velvet Chaff	59.5	58.5	1.7	1.7	26.4	**25.7**
48 Saskatchewan Red Fyfe	60.8	60.8	1.5	1.4	18.7	**24.8**
49 Salzer's Assiniboia Fyfe	59.5	59.1	1.1	1.3	15.8	**24.0**
50 Washington	60.1	59.6	1.3	1.3	14.4	**22.6**
51 Pringle's Defiance	58.8	59.4	1.2	1.3	13.2	**22.4**
52 Anglo-Canadian	53.0	55.6	1.3	1.6	11.1	**21.4**
53 Bearded Manitoba	. .	58.3	.7	.9	16.2	**16.6**
Average	59.27	59.24	1.38	1.43	18.28	**24.24**

The McCarlin and the Rio Grande varieties in the above table, which stand first and second respectively, bear a close resemblance to each other in leading characteristics. Both are strong growers, have tall straw, large heads, large grain, are fairly free from rust and are bearded.

TABLE XIV. Yields of ten varieties of Spring Wheat for one year only.

Varieties.	Weight per measured bushel.	Straw per acre.	Grain per acre.
	lb	tons.	bush.
54 Lost Nation	60.5	2.4	30.8
55 Wellman Fyfe	59.8	2.0	26.9
56 Velvet Chaff Blue Stem	58.8	1.6	25.8
57 Manitoba Red	60.0	1.9	24.6
58 Hayne's Blue Stem	59.5	1.7	24.2
59 New York Spring Wheat	58 8	1.7	23.4
60 The Mars	59.5	1.5	22.7
61 Dakota Marvel	57.0	1.6	17.2
62 Magyar	56.0	1.6	13.4
63 Campbell's White Chaff	53.5	1.1	13.2
Average	58.34	1.71	22.22

The Lost Nation, which stands at the head of the varieties grown for one year, though an old kind and tried several years ago at the station, was again re-introduced in the spring of 1892. Hayne's Blue Stem which has a velvet chaff was grown from a lot presented to the station by Prof. L. Foster, Director of the Agricultural Experimental Station, at Brookings, South Dakota. It is a variety of considerable promise. It stands well, is strong in the straw and is almost entirely free from rust. Campbell's White Chaff, which was much sought after, especially for trial plots early in the season, has not this year come up to the expectations formed of it. It was not grown at this station previously.

6. SPRING WHEAT. DIFFERENT DATES OF SEEDING.

The following table is a part of an experiment conducted simultaneously with barley, peas and oats to ascertain the results from sowing them at different dates. The spring wheat was sown in duplicate plots in 1891 and 1892 respectively, and each of the two plots contained a different variety. The plots were one one-hundred-and-sixtieth of an acre in size, and two bushels of seed were used per acre sown broadcast.

TABLE XV. Comparative yields of Spring Wheat from different dates of seeding.

Date of seeding.	Weight per measured bushel.			Straw per acre.			Yield of grain per acre.		
	1891.	1892.	Average.	1891.	1892.	Average.	1891.	1892.	Average.
	lb	lb	lb	tons.	tons.	tons.	bush.	bush.	bush.
April 22nd	60.5	60.9	60.7	1.45	.9	1.18	22.9	5.9	14.4
May 1st	59.0	58.5	58.8	1.37	.8	1.09	19.1	5.2	12.2
May 9th	56.7	.....	.....	1.04	1.0	1.02	13.2	4.0	8.6
May 18th	54.2	27.0	40.6	.89	1.0	.95	8.0	2.7	5.4
May 26th	53.0	Failure.	.....	.79	Failure.	.....	3.9	Failure.	.....
.....	51.5	Failure.	.....	.76	Failure.	.....	3.2	Failure.	.....

It will be observed that the best yields were obtained from the first seeding in each year. The heaviest weight per measured bushel was likewise obtained from the first seeding both seasons. There was a gradual decrease in every instance both in point of yield and weight of grain with every successive seeding. The crop from the last two dates of seeding in 1892 was a total failure. It would therefore seem greatly important to sow spring wheat at the earliest opportunity after the ground is ready for sowing.

7. Winter Wheat. Comparative Test of 62 Varieties.

In growing winter wheat, and indeed any other form of cereal crop, it is highly important that the farmers give much attention to the selection of the more useful varieties. In some seasons this is not so important, as almost any variety will give a fair return, but in others when the conditions of growth and ripening are not so favorable the difference in the yields in some instances amounts to nearly 50 per cent. with the varieties grown under the same conditions. As it is impossible to forecast the nature of the season, it is always better to be forearmed by sowing varieties possessed of sufficient vigor and hardihood to enable them to bear up well under adverse conditions.

The qualities to be sought in winter wheat include the following:

1. Ability to give good yields. Occasionally we meet with varieties having nearly all the requisites given below, and yet the yield from them is only ordinary.
2. The quality of the grain, including weight per bushel and value for milling purposes. A variety possessing good milling properties is certainly to be much preferred to one equal in other respects but lacking in these.
3. Strength of straw. This is very important in some seasons, more especially on soils where the grain is liable to lodge, as it bears so directly on the yields and on the labor of harvesting.
4. Non-liability to rust. Although rust is largely dependent on season, soil and location, some varieties have the power of resisting it in a marked degree.
5. Earliness in maturing. This is also intimately associated with yield, as in some seasons an advantage of from three to five days in early ripening will make a great difference in the returns.
6. The presence or absence of beards. Beards are so far objectionable unless there is decided superiority in other directions, as they are less pleasant to handle, they lessen the value of the chaff for feeding purposes and are associated more or less with lack of refinement in quality.

Owing to the low prices ruling for winter wheat there will be an inclination to sow a less acreage this season. This tendency can easily be carried too far. We do well to remember that we have an excellent wheat-producing country and that we want large quantities of straw for bedding which cannot be secured so effectually in any other way. There is always less hazard in growing a variety of crops, and it also furnishes a more equable division of the work of the farm. And there is at the same time a possibility of some advance in prices. It is at least questionable as to whether this Province should at any time grow less wheat than will suffice for home consumption.

Location and Soil. All the varieties of winter wheat, both native and foreign, were grown in plots side by side in the same range. These plots contain each exactly the one one-hundreth part of an acre. The yield per acre is estimated from the actual yield of the plots. The aspect of the land is south-westerly, with so little slope, however, that it is almost imperceptible. The soil may be designated a mild clay loam.

Preparation of the Soil. The soil was prepared on the bare fallow system to secure uniformity of condition in a field devoted to the growth of experimental grains. This was the only bare fallow that we had on the farm. The cultivation given was much the same as is usually put upon bare fallows. Barnyard manure was applied at the rate of 15 tons per acre in the spring of 1890, and a crop of rape was grown and pastured off upon the land the same year. No manure has been put upon it since.

Selection of Varieties. In selecting varieties to sow, those kinds should be preferred which have given the most satisfaction during a term of years rather than for one year. We sometimes find varieties give excellent yields one year which do very poorly the next. We are now able to give facts relating to the behavior of a considerable number of varieties for three years as shown in Table xvii, and these should certainly prove valuable to the farmers of this province engaged in growing winter wheat.

The Varieties Grown. There were in all 115 plots of winter wheat grown at this station during the present year, including 68 varieties. Of these, 35 varieties were grown in duplicate plots ; and in another field 8 varieties were grown in plots varying from half an acre to two acres. The larger plots were duplicates of some of the smaller ones, and the particulars relating to them will be given later in the report. Of the 68 varieties grown, 44 were Canadian and American and 24 were foreign. The foreign varieties which were imported originally from Germany, England, France, and Russia in 1889, are all from last year's seed.

Table xvi. Characteristics of 44 varieties of Winter Wheats.

Varieties.	Nature of head.	Color of		Date of maturity.	Comparative am't of rust. (0 none, 100 much.)	Per cent. of straw lodged at harvest.
		Chaff.	Grain.			
1 Surprise	Bald	White	White	July 27	30	10
2 Early Red Clawson	"	Red	Red	" 26	50	50
3 Rodgers	"	White	"	" 27	25	70
4 Red Velvet Chaff	"	"	"	" 27	25	70
5 Golden Drop	"	Red	"	" 26	50	70
6 Bonnell or Landreth	"	White	White	" 25	20	70
7 Golden Cross or Volunteer	Bearded	Red	Red	" 26	60	20
8 Manchester	Bald	White	"	" 27	45	30
9 Standard	"	Red	White	" 25	45	40
10 Hybrid Mediterranean	Bearded	"	Red	" 26	40	70
11 Martin Amber	Bald	White	White	" 27	45	85
12 Seneca or Clawson	"	Red	White	" 25	30	50
13 Lancaster	Bearded	"	Red	" 26	45	95
14 Red Lyon	"	"	"	" 26	25	97
15 New Monarch	Bald	White	"	" 26	50	30
16 American Bronze	"	"	"	" 28	60	5
17 Egyptian	Bearded	"	"	" 26	40	60
18 Garfield or Natural Cross	Bald	"	White	" 26	25	90
19 Jones' Winter Fyfe	"	"	Red	" 26	45	50
20 Bulgarian	Bearded	"	White	" 26	35	30
21 Winter Pearl	Bald	"	"	" 28	40	60
22 Canadian Velvet Chaff	"	"	"	" 26	25	60
23 Democrat	Bearded	"	"	" 26	25	40
24 Dawson's Golden Chaff	Bald	Red	"	" 26	80	0
25 Mediterranean	Bearded	White	Red	" 26	65	90
26 Fulcaster	"	"	"	" 24	45	60
27 Red Wonder	"	"	"	" 27	55	95
28 Deitz Longberry	"	"	"	" 26	55	80
29 Reliable	"	"	"	" 27	25	10
30 Fultz	Bald	"	"	" 24	40	10
31 Russian Amber	Bearded	"	"	" 26	30	40
32 Coryell	Bald	Red	"	" 24	60	80
33 Rutherford	Bearded	"	"	" 26	35	90
34 Rumsey	"	White	White	" 29	25	40
35 Genesee	"	"	"	" 26	40	50
36 Valley	"	"	Red	" 26	30	10
37 Walker's Reliable	"	"	"	" 27	30	50
38 Hybrid Delhi	Bald	"	White	" 27	20	78
39 Monette	"	"	Red	" 28	35	50
40 Red Russian	"	Red	"	" 27	30	20
41 Longberry Red	Bearded	"	"	" 27	50	80
42 Velvet Chaff	"	"	"	" 24	40	10
43 Manilla	Bald	White	White	" 26	40	50
44 Scott	"	"	Red	" 27	30	10

The extent to which the plots were affected by rust and by weak straw may be noticed at a glance by referring to the two right hand columns respectively of the table, but it should be remembered that these relate only to the present year.

Manner and Time of Seeding. The seed was sown by hand as we have no machines suitable for sowing in drills in plots of the size mentioned. The plots were all sown September 2nd, with the exception of Nos. 27, 29, 36, and 40 mentioned above, which were sown September 9th, and Nos. 34, 37 and 39, which were sown September 15th. The same amount of seed was sown upon each plot, and at the rate of $1\frac{2}{3}$ bushels per acre by weight.

The Conditions of Season and Weather. These were on the whole not so favorable as during the previous wheat year. The weather in the autumn was such that all the Canadian and American varieties made a good growth, and they also passed the winter safely. But the months of May and June were abnormally wet, which along with the heavy winds that prevailed caused more or less of lodging in nearly all the varieties. Some of them also rusted considerably. In fact none of them could be said to be entirely free from leaf rust. During the ripening period the temperature was unduly high, but notwithstanding the yields were in many instances fair.

Table xvii. Yields of 15 varieties for three years.

Varieties.	Straw per acre (tons).		Weight per measured bushel (lb).		Grain per acre (bush. 60 lb.).	
	1892.	Average 1890-1-2.	1892.	Average 1890-1-2.	1892.	Average 1890-1-2.
Surprise	3.43	2.71	59.8	60.6	45.7	**46.37**
Early Red Clawson	3.22	2.57	59.3	59.9	46.7	**45.70**
Rodgers	3.23	2.53	60.0	61.1	40.5	**43.23**
Red Velvet Chaff	3.07	2.49	57.5	60.8	35.8	**42.83**
Golden Drop	3.46	2.53	62.0	62 1	51.2	**42.66**
Bonnell or Landreth	3.27	2.76	58.4	60.7	34.3	**41.96**
Golden Cross or Volunteer	2.83	2.50	61.5	61.3	43.8	**41.93**
Manchester	3.41	2.47	60.4	62.0	45.4	**41.17**
Standard	3.44	2.73	57.8	60.2	31.8	**40 60**
Hybrid Mediterranean	3.53	2.72	61.0	61.8	45.5	**40 53**
Martin Amber	3.18	2.65	60.2	61.2	37.3	**40.07**
Seneca or Clawson	3.45	2.76	58.8	60.2	34.0	**39.43**
Lancaster	3.61	2.86	61.5	62.6	41.3	**39.13**
Red Lyon	3.96	2.81	61.1	61.7	41.2	**38.30**
New Monarch	3.27	2.49	61.5	60.6	41.1	**33.97**

As the facts given in Table xvii relate not only to results of this year's crop, but also to the average obtained for the past three years, they may be regarded as of special importance. The average yield of grain per acre of these 15 varieties was 30.9 bush. in 1890; 51.6 bush. in 1891, and 41 bush. in 1892. For the three years the average was 41.19 bush. The average weight per bush. in 1890 was 60 lb.; in 1891, 63.3 lb.; in 1892, 60 lb. For the three years the average was 61.1 lb. The Surprise heads the list in point of yield, averaging 46.37 bush. per acre for the three years. It is possessed of many good qualities, as ability to yield well, good strength of straw, freedom from rust and good milling properties The Early Red Clawson follows closely with an average yield of 45.70 bush. Its earliness of ripening is a strong point in its favor. The Rodgers, which comes third on the list, does not stand high as to milling properties. The Manchester, which yields well in some localities, has not done so well with us, as it is somewhat prone to rust. The Red Lyon, which several years ago was sold in some localities for $15 per bush., is very weak in the straw. It weighs well, and this is the best feature about it.

TABLE XVIII. Yields of 8 varieties for two years.

Varieties.	Straw per acre (tons).		Weight per measured bushel (lb).		Grain per acre (bushel 60 lb).	
	1892.	Average 1891-2.	1892.	Average 1891-2.	1892.	Average 1891-2.
American Bronze	3.38	2.77	59.3	61.1	39.8	52.5
Egyptian	3.32	2.63	61.5	62.7	47.5	50.4
Garfield or Natural Cross	2.87	2.69	59.3	60.6	32.5	48.4
Jones' Winter Fyfe	2.54	2.15	59.2	61.7	37.8	47 1
Bulgarian	3.08	2.34	61.6	63.0	47.7	47.0
Winter Pearl	2.84	2.67	60.5	60.7	36.1	45.8
Canadian Velvet Chaff	2.98	2.40	55.4	58.8	30.7	45.3
Democrat	3.18	2.43	62.0	63.2	47.2	44.4

These varieties have been grown here for but two years, and like those of the previous table, under the same conditions. The average yield obtained from them in 1891 was 55.3 bush. per acre; in 1892, 39.9 bush.; for the two years, 47.6 bush. The average weight per bush. in 1891 was 63.2 lb.; in 1892, 59.9 lb.; for the two years, 61.5 lb. The American Bronze, which stands first in point of yield for the two years, did not give nearly so good a return comparatively this year as last. Although it stood up well, it was considerably affected with rust. The Egyptian, though an old variety, has done well, and it will also be observed that it weighs well. The Garfield, coming third in point of yield, betrayed considerable weakness of straw, while the plots on either side of it stood up well. Jones' Winter Fyfe, although possessed of first-class milling properties, is only medium as to yield and weight of grain. The Bulgarian, which bears considerable resemblance to the Democrat, yields fairly and weighs well. It seems to be a rugged wheat, and is possessed of good milling properties. The Canadian Velvet Chaff has done rather poorly with us this year. The yield of grain was comparatively low, and it was notably deficient in weight.

TABLE XIX. Yields of 21 varieties for one year.

Varieties.	Straw per acre.	Weight per measured bushel.	Grain per acre.
	tons.	lb.	bush. (60 lb.).
Dawson's Golden Chaff	3 46	59.5	51.2
Mediterranean	3.42	61.8	50.9
Fulcaster	3.23	64.5	50.5
Red Wonder	4.18	62.8	48.8
Deitz Longberry	3.34	61.9	48.7
Reliable	3.14	62.2	47.9
Fultz	3 12	62 5	47.5
Russian Amber	3 26	61.5	46.7
Coryell	2.86	61.5	46.2
Rutherford	3.61	59.8	46.2
Rumsey	3.35	61.5	45.1
Genesee	3.43	61.0	43.8
Valley	2.59	61.5	43.7
Walker's Reliable	2.66	60.4	42 9
Hybrid Delhi	2.86	59.5	42.8
Monette	3.34	59.0	42.1
Red Russian	3.16	61.4	41.4
Longberry Red	3.34	61.0	41.2
Velvet Chaff	2 98	63 0	40.5
Manilla	3.59	58.7	38 6
Scott	2.70	61.0	32.5

The 21 varieties in Table IV were grown here this year for the first time in these comparative tests, and considerably more than one-half the number were imported from the United States. The average yield per acre is 44.74 bush., and the average weight per measured bush. 61.3 lb. The yield of straw is abnormally large, being 3.2 tons tons per acre, which is probably 50 per cent. more than in ordinary seasons. Weighing the straw at a later date would doubtless cause some reduction. The Dawson's Golden Chaff, originated in 1881 by Robert Dawson, of Paris, Ont., comes first in point of yield. This wheat stood up better than any other variety, but it was affected considerably by rust, which no doubt affected the quality of the grain.

The old Mediterranean, imported from the United States, comes second in point of yield, showing that it still retains its old time vitality. The Fulcaster, also from the United States, gave the remarkable weight of 64.5 lb. to the bush. The Red Wonder came out well, but is very weak in the straw. It would probably do well on sharp, sandy land. The Scott, so popular at one time, seemed to be lacking in vitality, and stands at the foot of the list in point of yield.

TABLE XX. Comparative summary of results.

——	Number of varieties.	Average yield of straw per acre (tons).	Average weight per measured bushel (lb).	Average yield of grain per acre (bush. 60 lb).
Bald	24	3.29	59.61	40.15
Bearded	20	3.17	61.64	45.53
White Chaff	30	3.17	60.55	42.30
Red Chaff	14	3.35	60.65	43.51
White Wheat	15	3.23	59.60	39.92
Red Wheat	29	3.23	61.08	43.97

It will be observed here that generally speaking the bearded red chaff red wheats gave more straw and more grain per acre, and also gave grain weighing more per bush. than the bald white chaff white wheats. There is very little difference in the relative quantities of straw produced. In weight of grain the average difference in favor of the bearded varieties as compared with the bald is 2.03 lb. per bush. In 1891 the difference (1.37 lb.) is also in favor of the bearded sorts. The red wheats outweigh the white varieties by 1.48 lb. per bush. In 1891 the difference in the same direction was 1.96 lb. In 1892 the bearded varieties gave an average yield of 5 bush. per acre more than the bald, while in 1891 the bald varieties yielded 9.9 bush. per acre more on an average than the bearded. The present season the red wheats yielded 4 bush. per acre more than the white, while last season the white wheats yielded over 5 bush. more than the red. In Bulletin LXVII., issued on winter wheats in 1891, it is stated "that when wheat is grown under favorable conditions the bald varieties yield considerably more than the bearded." To this we may add that from the results obtained this year it would seem to be true that in seasons when the conditions are not really favorable the bearded varieties will yield more than the bald.

As we had a limited quantity of seed for distribution, in a bulletin issued Aug. 22nd, 1892, we appended the following in reference to it: "We will supply any of the following varieties, viz., American Bronze, Jones' Winter Fyfe, Early Red Clawson, and Bulgarian, in lots of one and two bushels. As the quantity of each variety is limited we can only agree to furnish seed while the supply lasts and in the order in which we receive the applications. The prices charged will be moderate. For further information apply to the Professor of Agriculture, Guelph, Ont.

"Some of the varieties will be distributed in smaller lots through the medium of the Ontario Agricultural and Experimental Union. This Union, which meets annually at the Agricultural College, is composed of the officers, ex-students, and students of the

College, and all farmers throughout the Province are invited to co-operate in the work that is being carried on by the Association. This work consists of the testing of seeds and fertilizers under conditions as nearly similar as may be found practicable. The seeds are furnished by the Union free to farmers, and full instructions regarding the mode of conducting the tests are also furnished at the same time. The only return asked of the farmer is a report of the results to be sent after harvest by a time fixed upon as mentioned in the instruction sheet. These reports are made upon blank forms furnished to each experimenter along with the instructions. At the present time there are no less than 5,088 plots under experiment in this Province conducted by ex-students and other farmers, the results of which are published annually, and cannot fail to be of much service to the agriculturist.

In the subjoined table will be found the different sets of varieties of wheats which will be sent by mail in half-pound lots of each variety to farmers applying for them and in the order of the application so long as the supply lasts.

Three sets of Fall Wheat for Co-operative Tests.

(1.)	(2.)	(3.)
Dawson's Golden Chaff.	Dawson's Golden Chaff.	Dawson's Golden Chaff.
American Bronze.	American Bronze.	American Bronze.
Early Red Clawson.	Fulcaster.	Jones' Winter Fyfe.
Bulgarian.	Red Wonder.	Fultz.
Mediterranean.	Surprise.	Golden Drop.

Each farmer wishing one of these sets will please address the Secretary, C. A. Zavitz, Experiment Station, Guelph, *mentioning which set he desires*, when the grain, with instructions for testing and blank forms on which to report, will be forwarded free of cost to his address."

Conclusions.

The results of the experiments may be thus summarized :

1. That the average yields per acre of the 44 Canadian and American varieties grown in 1892 were : straw 3.2 tons, grain 42.6 bush. per acre and weight per bush. 60.5 lb.

2. That as the averages obtained from the 15 varieties grown at this station for three years were 30.9 bush. in 1890 ; 51.6 bush. in 1891, and 41.6 bush. in 1892, while the average weight per bush. in these respective years was 60, 63.3 and 60 lb., we are justified in concluding that the wheat producing capabilities of Ontario are still of a high order.

3. The four best yielding varieties in 1892, all of which gave more than 50 bush. per acre, are Dawson's Golden Chaff, Golden Drop, Mediterranean and Fulcaster, named in the order of the yields which they made.

4. The four varieties giving the heaviest weights per bush. in 1892 were the Fulcaster, 64.5 lb. ; Velvet Chaff (bearded), 63 lb. ; Red Wonder, 62.8 lb., and Fultz, 62.5 lb.

5. The four best yielding white wheats in 1892, were Dawson's Golden Chaff, Bulgarian, Democrat and Surprise, and the four best yielding varieties of red wheat were the Golden Drop, Mediterranean, Fulcaster and Red Wonder, in the order named in both instances.

6. That the bald Velvet Chaff varieties gave an average of 7.8 bush. less per acre than the mean average of the 44 varieties grown in 1892 and weighed 3.1 lb. less per bush.

7. That in our experience of the past three years the average yields per acre of the red and white wheats have not been far different, being about one bushel per acre in favor of the white wheats.

8. That in our experience of the past three years we have found that the red wheats average from 1 to 2 lb. more per bush. than the white wheats.

Winter Wheats. Comparative Test of Foreign Varieties.

These foreign varieties have been grown upon the experimental plots for three years. When we reported upon them in 1891, we hesitated to recommend them to Canadian growers, because of their lack of hardiness. With a number of them there has been some improvement, but we do not feel justified even now in recommending them for general cultivation. The size of the plots was one one-hundreth of an acre. The seed was sown by hand, broadcast, on September 2nd, 1891, and at the rate of $1\frac{2}{3}$ bushels per acre. The general cultivation was the same as that given to the Canadian and American varieties.

Table xxi. Yields of eighteen varieties of foreign winter wheats.

Varieties.	Country obtained from.	Number of years grown at O. A. C.	Weight per measured bushel.		Straw per acre.		Grain per acre (bush. 60 lb.)	
			1892.	Average 3 years '90-91-92	1892.	Average 3 years '90-91-92	1892.	Average 3 years '90 91-92.
			lb.	lb.	tons.	tons.	bush.	bush.
1 Square Head	Germany	3	52.75	56 92	.....	.....	48.20	**39.47**
2 Dividend	"	3	51.50	55.09	3.66	2.93	27.92	**32.71**
3 Lamed Hybrid	France	3	55.00	57.75	3.03	2.01	36.57	**30.60**
4 Russian Odessa	Russia	3	54.25	59.20	2.64	2.01	22.92	**30.11**
5 Spalding Red.	England	3	54.50	57.59	3.02	2.03	30.93	**30.03**
6 Golden Drop Red	"	3	51.50	57.00	2.98	1.82	27.40	**30.00**
7 Imperial Velvet Chaff	"	2	51.50	55.50	2.98	.....	.....	**29.64**
8 White Patenelle	France	3	53.00	56.59	3.56	2.09	34.68	**28.37**
9 Square Head Red	England	3	59.00	59.75	2.64	1.83	28.75	**27.36**
10 Herefordshire White	"	3	50.25	56.17	2.17	1.80	19.48	**26.84**
11 Regent	Germany	2	52.00	56.30	1.88	.....	14.33	**25.29**
12 Browick Red	England	3	53.00	56.83	3.06	1.94	26.35	**24.20**
13 Miracle	Germany	2	55.00	58.30	2.77	.....	27.72	**24.17**
14 Lammas Red	England	3	53.00	57.33	3.20	1.97	23.33	**23.74**
15 Saumur	France	3	52.75	56.75	2.92	1.78	26.88	**22.85**
16 Kessingland Red	England	3	49.50	54.10	3.15	.....	22.50	**22.01**
17 Galezien Summer	Germany	3	53.00	59.50	1.82	1.50	14.48	**20.8**
18 Red Inversible	France.	3	54.00	58.00	3.01	1.70	25.63	**19.80**

Several of these varieties are possessed of characteristics which are very valuable in a crop of winter wheat, such as freedom from rust and strength of straw. But their lack of ability to endure our winters, and lateness of ripening, seem to give them a lower place than that occupied by nearly all our Ontario varieties. When they become better acclimatized, some of the varieties may find a place in general cultivation. The Galezien Summer stands high in the estimation of millers for giving strength to the flour, and the Miracle for giving colour to the same. They were both imported from Germany, but whereas the Galezien Summer stood first in point of yield of all the foreign varieties grown in 1890, and the Miracle was among the lowest yielding varieties, the former is rapidly deteriorating while the latter is improving considerably.

8. Winter Wheat, application of Fertilizers.

This experiment relates to the application of different commercial fertilizers, alone and in various combinations, upon plots of the Canadian Velvet Chaff winter wheat. These plots were one-twentieth of an acre in size. The fertilizers were applied broadcast, April 15th, 1891. When these were used separately the following amounts were applied per acre, viz.: nitrate of soda and muriate of potash, 160 lb. each, and superphosphate 320 lb. When two of these fertilizers were used in combination, one-half the quantity of each was applied that is mentioned above. When three of them were used in combination, one third of the quantity of each as mentioned above was used. Salt was applied at the rate of 400 lb. per acre.

The object of this experiment was to ascertain the effect of these fertilizers upon the yield of wheat in a soil which may be termed a gravelly loam. It will also serve in some measure as a guide to the farmer in the quantities of these fertilizers to apply when testing the wants of his soil with reference to the application of fertilizers.

TABLE XXII. Winter wheat, application of fertilizers.

Fertilizers.	Yields of grain per acre (bush. 60 lb.)
	bush.
Nitrate of Soda and Muriate of Potash	27.66
Nitrate of Soda	26.33
Superphosphate and Muriate of Potash	25.33
Salt	24.33
Superphosphate and Nitrate of Soda	24.00
Nitrate of Soda, Muriate of Potash and Superphosphate	23.66
Muriate of Potash	22.66
No fertilizer	22.66
Superphosphate	21.66

It will be observed that while the combination of nitrate of soda and muriate of potash give the best results, when the fertilizers are used singly, the largest yield was obtained from nitrate of soda, while the superphosphate seemed of no value whatever to the wheat crop. The teaching of this experiment would serve to show that the soil of this field was more in need of nitrogen than of potash, and of potash than of phosphoric acid. Some profit was probably derived from some of those applications, especially the first, but the exact profit is not easily ascertained, owing to the unexhausted increment left in the soil which varies with the season and the crop. It will be remembered that these results are in no sense to be taken as guides where the soil conditions differ, and even where they may be somewhat similar, as they are the result of but one season's test.

9. OATS. COMPARATIVE TEST OF 116 VARIETIES.

In 1892, 116 varieties of oats were grown. The plots were each one-hundredth of an acre in size. The grain was all sown April 18th. The seed was sown broadcast at the rate of 2¼ bush. per acre. The ground was then harrowed and rolled Table XXIII gives the characteristic, relating to the 116 varieties grown during 1892, and tables XXIV, XXV, and XXVI give the yields of the varieties grown for four years, two years and one year respectively. The varieties are arranged in each table according to the average yields of grain per acre for the period indicated.

The time of maturing (Table XXIII.) extended from August 3rd to August 15th, a period of only twelve days. They ripened too quickly, owing to weather unduly hot at the time, hence the yields were much less than they would otherwise have been. The 11 varieties which came first to maturity gave an average yield of 55.3 bushels per acre, and the 13 sorts which came last to maturity gave an average yield of 48.9 bushels per acre. This would seem to indicate that we may expect the largest average yields from the early maturing sorts. The early ripening varieties were somewhat more free from rust than the later ones, and the former were all white in color, while some of the latter were black and some yellow. The varieties giving the greatest length of plant measured 63 inches, and that variety which gave the shortest length of the same measured 42 inches. The 9 varieties which were over 60 inches in height, gave an average yield of 54.7 bushels per acre, and the 10 kinds which were under 40 inches in height gave an average yield of 57.5 bush. per acre.

TABLE XXIII. Characteristics of 116 varieties of Oats.

Varieties.	Country obtained from.	Number of years grown at O. A. C.	Date of maturity.	Length of plant.	Amount of rust.	Amount of straw lodged.	Nature of head.	Color of grain.
			Aug.	In.				
1 Joanette Black	France	4	7	43	None	Medium.	Spreading	Black.
2 Chenailles Black	"	4	6	43	"	"	"	"
3 Black Etampes	"	4	7	42	"	"	"	"
4 Siberian	Russia	4	6	56	Slight	Slight	"	White.
5 Houdan Black	France	4	6	47	None	None	"	Black.
6 Danebrog	Germany	4	6	60	Very slight.	"	"	White.
7 Oderbrucker	"	4	7	54	Slight	Medium.	"	"
8 Improved Besthorn	"	4	8	59	Very slight.	Small	"	Yellow.
9 Probsteier	"	4	8	60	Medium	Medium.	"	White.
10 Pringle's Progress	Ontario	4	4	51	Slight	"	"	"
11 Poland White	France	4	4	62	"	None	"	"
12 Waterloo	Germany	4	8	56	Medium	Large	"	"
13 White Canadian	"	4	10	59	None	None	"	"
14 Georgian	"	4	7	52	Slight	Slight	"	"
15 Bavarian	Ontario	4	12	60	"	Medium.	"	"
16 Egyptian	"	4	8	58	"	Slight	Mane	"
17 Siberian	France	4	4	57	"	"	Spreading	"
18 Yellow Gigantic	"	4	13	60	Very slight.	None	Mane	Yellow.
19 Acclimatized Black Tartarian	Ontario	4	8	60	Slight	Small	"	Black.
20 Black Poland	Scotland	4	8	56	Large	Large	"	"
21 Yellow August	Germany	4	14	57	Very slight.	Slight	Spreading	Yellow.
22 Black Hungarian	France	4	12	61	Slight	None	Mane	Black.
23 Black Champion	Ontario	4	11	62	"	Small	"	"
24 Nubian Black	Germany	4	12	58	Very slight.	None	"	"
25 Improved Waterloo White	England	4	9	59	Slight	Small	Spreading	White.
26 Flying Scotchman	"	4	4	61	"	Large	"	"
27 White Tartarian	Russia	4	13	52	Medium	"	"	"
28 Black Tartarian	Scotland	4	12	61	Slight	None	Mane	Black.
29 California White	Germany	4	13	61	"	Slight	"	White.
30 Victoria White	Scotland	4	4	63	"	"	Spreading	"
31 Rosedale	Ontario	4	8	54	Medium	Medium.	Mane	"
32 White Abundance	France	4	13	56	Large	Large	Spreading	"
33 Cluster or Triumph	Ontario	4	3	59	Slight	Small	"	"
34 Potato	New Zealand.	4	12	58	Very slight.	Slight	"	"
35 August White	Germany	4	10	57	Slight	"	"	"
36 Georgian White	France	4	13	51	Medium	Large	"	White.
37 Black Red Crown	"	4	14	45	"	Medium.	"	Black.
38 Early Blossom	England	4	3	54	Slight	Slight	"	White.
39 Hopetown	Ontario	4	10	49	Very slight.	"	"	"
40 Podolischer	Russia	4	3	55	Slight	Large	"	"
41 Victoria Prize White	England	4	3	55	"	Medium.	"	"
42 American Welcome	Germany	4	3	57	"	"	"	"
43 White Tartarian	Scotland	4	13	58	Very slight.	Slight	Mane	"
44 Black Tartarian	Ontario	4	11	50	Slight	Small	"	Black.
45 Pedigreed Black Tartarian	"	4	12	50	Large	Medium.	"	"
46 Dutch Bren	England	4	3	53	Slight	Large	Spreading	White.
47 Carter's Prize Cluster	Ontario	4	4	54	"	Medium.	"	"
48 White	Australia	4	3	56	"	"	"	"
49 Colommiers	France	4	13	51	"	None	"	Black.
50 Welcome	Ontario	4	3	56	"	Small	"	White.
51 White Hungarian	France	4	14	57	"	None	"	"
52 White Poland	Russia	4	7	55	"	Small	"	"
53 Brie Black	France	4	15	51	"	None	"	Black.
54 Rennie's Prize Cluster	Ontario	4	3	53	"	Medium.	"	White.
55 Providence	Sweden	4	9	52	"	None	"	"
56 Racehorse	Ontario	4	3	54	"	Large	"	"
57 Round or Branching Black	France	4	13	46	"	None	"	Black.

TABLE XXIII.—*Continued.*

	Varieties.	Country obtained from.	Number of years grown at O. A. C.	Date of maturity.	Length of plant.	Amount of rust.	Amount of straw lodged.	Nature of head.	Color of grain.
				Aug.	In.				
58	Flanders White	France	4	10	53	Slight	None	Spreading	White.
59	Dun	New Zealand	4	12	56	Very slight	"	"	Dun.
60	Thurigen	Germany	4	15	49	Slight	"	"	Yellow.
61	Prolific Black	California	4	11	50	Medium	"	Mane	Black.
62	Bertram's Prolific	Scotland	4	11	53	"	"	Spreading	White.
63	Longfellow	Germany	4	10	62	Slight	"	"	"
64	Hamilton	Scotland	4	10	50	"	"	"	"
65	Yellow Flanders	France	4	11	52	"	"	"	Yellow.
66	Port Adelaide	Australia	4	4	54	"	Large	"	White.
67	Early Racehorse	England	4	3	55	"	Medium	"	"
68	Longfellow	Scotland	4	11	58	"	None	"	"
69	Potato	"	4	4	54	"	Large	"	"
70	Scotch Potato	Russia	4	10	46	"	None	"	"
71	Dun	Scotland	4	10	48	"	"	"	"
72	Angus	"	4	8	57	Very slight	Small	"	"
73	Triumph	Australia	4	10	57	Slight	None	"	"
74	Birlie	Scotland	4	9	50	"	Large	"	"
75	Australian White	Australia	4	10	54	"	None	"	"
76	Improved Scotch	Ontario	4	9	55	"	"	"	"
77	Hopetown	Germany	4	10	61	"	"	"	"
78	Hungarian Black	Hungary	4	12	53	Medium	"	Mane	Black.
79	Hopetown	Scotland	4	11	54	Slight	"	Spreading	White.
80	Red Spot	France	4	8	51	"	Large	"	Dun.
81	Selected Winter	England	4	12	54	"	None	"	"
82	Golden Giant	Ontario	2	14	49	"	"	Mane	White.
83	Magnet	"	2	11	49	"	"	Spreading	"
84	Vick's American Banner	United States.	2	8	54	Large	"	"	"
85	Holstein Prolific	Ontario	2	7	51	Medium	"	"	"
86	White Mane	"	2	10	49	Slight	Medium	"	"
87	White Schonen	"	2	8	53	"	None	"	"
88	Danish	New Zealand	2	8	51	Medium	"	"	"
89	Wide-Awake	Ontario	2	7	53	Slight	"	"	"
90	Giant Swedish	"	2	13	55	Medium	"	Mane	Yellow.
91	Early Calder	"	2	8	49	Slight	Medium	Spreading	White.
92	Giant Yellow	United States.	2	3	50	"	Small	"	Yellow.
93	Early Gothland	Ontario	2	7	61	"	"	Mane	White.
94	White Swiss	United States.	2	9	54	"	"	"	"
95	Black Mane	Ontario	2	12	53	"	None	"	Black.
96	White Belgian	"	2	6	59	"	Medium	Spreading	White.
97	Black Glen Rothern	"	2	15	48	Very slight	None	"	Black.
98	Early Archangel	"	2	4	53	Slight	Medium	"	White.
99	Clydesdale	"	2	4	55	"	"	"	"
100	Steele's New White Cave	"	2	7	55	"	None	Mane	"
101	Japan	United States.	2	4	59	"	Medium	Spreading	"
102	New Rosedale White	Ontario	2	10	55	Medium	None	Mane	"
103	Carter's Early Black	England	2	....	49	Slight	"	"	Black.
104	Canadian Triumph	Ontario	2	4	54	"	Small	Spreading	White.
105	Dakota	United States.	2	4	58	"	"	"	"
106	Victoria Prize White	England	2	4	53	"	Medium	"	"
107	Rennie's Prize White	Ontario	2	3	59	"	"	"	"
108	Carter's Prize Cluster	England	2	4	57	"	"	"	"
109	American Beauty	Ontario	1	12	59	None	None	Mane	"
110	Joanette	"	1	13	48	Slight	Medium	Spreading	Black.
111	Abyssinian	"	1	14	59	Medium	None	Mane	White.
112	Baltic White	United States.	1	12	57	Slight	"	Spreading	"
113	Thousand Fold	"	1	7	59	"	Trace	Mane	"
114	Wilson's White Prolific	"	1	....	....	....	....	....	"
115	New Wonderful	Ontario	1	10	48	Slight	Medium	....	"
116	Badger Queen	United States.	1	7	52	....	Large	....	"

TABLE XXIV. Yield of 81 varieties of Oats for four years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre (bushel 34 lb.)	
	1992.	Average 3 years 1890-91-92.	1892.	Average 4 years, 1889-90-91-92.	1892.	Average 4 years, 1889-90-91-92.
	lb.	lb.	tons.	tons.	bush.	bush.
1 Joanette Black	36.0	35.8	2.8	2.7	76.5	83.0
2 Chenailles Black	35.6	35.8	2.7	2.8	73.4	79.1
3 Black Etampes	36.1	36.4	2.7	2.6	76.1	79.0
4 Siberian (Russian)	34.6	36.7	2.6	2.5	75.6	77.2
5 Houdan Black	38.9	36.4	2.2	2.1	72.1	77.1
6 Danebrog	32.9	33.7	2.3	2.4	69.9	75.4
7 Oderbrucker	27.3	30.2	2.8	2.5	82.4	75.1
8 Improved Besthorn	29.5	33.5	2.4	2.0	74.9	74.7
9 Probsteier	28.6	33.0	3.3	2.5	79.8	74.5
10 Pringle's Progress	30.0	30.1	2.1	2.3	74.7	74.2
11 Poland White	36.3	38.8	2.4	2.3	68.8	74.1
12 Waterloo	26.5	31.7	3.1	2.5	77.9	74.0
13 White Canadian	34.9	34.3	2.6	2.7	60.0	72.8
14 Georgian	31.0	33.4	2.5	2.6	65.3	71.4
15 Bavarian	24.9	31.4	2.9	2.6	71.4	70.8
16 Egyptian	33.6	36.5	2.2	2.7	58.2	70.3
17 Siberian (French)	40.5	38.3	2.1	2.1	56.2	70.0
18 Yellow Gigantic	28.0	29.4	2.5	2.6	71.8	68.8
19 Acclimatized Black Tartarian	26.5	29.9	2.7	2.5	66.7	68.6
20 Black Poland	22.5	30.8	3.8	2.9	50.8	67.0
21 Yellow August	30.8	31.3	2.5	3.0	70.5	65.5
22 Black Hungarian	25.8	30.8	2.6	2.8	54.1	65.1
23 Black Champion	28.1	30.5	2.6	2.4	61.4	65.1
24 Nubian Black	29.9	32.0	2.3	2.6	55.9	64.8
25 Improved Waterloo White	31.9	32.7	2.1	2.0	68.6	64.3
26 Flying Scotchman	33.3	37.9	2.4	2.3	52.6	64.3
27 White Tartarian	28.6	29.6	2.6	3.3	61.0	64.2
28 Black Tartarian	28.8	33.3	2.4	2.7	52.1	64.1
29 California White	34.8	34.3	2.7	2.7	67.4	64.0
30 Victoria White	37.5	40.7	2.3	2.4	57.2	64.0
31 Rosedale	29.8	35.6	3.0	2.9	67.5	63.5
32 White Abundance	25.4	32.6	2.8	2.5	35.5	62.6
33 Cluster or Triumph	37.5	39.4	2.3	2.2	58.9	61.7
34 Potato	31.3	37.0	2.6	2.4	46.3	60.8
35 August White	36.9	39.5	2.7	2.9	57.7	60.7
36 Georgian White	26.8	32.2	2.9	2.8	28.5	60.7
37 Black Red Crown	33.0	32.8	2.1	2.3	58.1	60.6
38 Early Blossom	41.4	40.0	2.1	2.2	58.0	60.6
39 Hopetown	33.4	34.4	1.9	2.3	56.4	60.0
40 Podolischer	40.5	40.4	2.1	2.5	57.5	59.9
41 Victoria Prize White	35.4	39.2	2.4	2.0	54.9	59.8
42 American Welcome	40.3	40.9	2.1	2.3	57.2	59.6
43 White Tartarian	27.0	32.8	3.1	3.2	24.4	59.1
44 Black Tartarian	30.9	32.6	1.8	2.0	52.8	59.1
45 Pedigreed Black Tartarian	30.5	35.3	2.0	2.2	51.3	59.0
46 Dutch Bren	36.5	38.8	2.6	2 2	60.9	58.7
47 Carter's Prize Cluster	38.8	40.7	2.0	2.1	51.3	58.1
48 White	37.6	40.2	2.2	2.1	52.2	57.8
49 Colommiers	31.4	32.3	2.3	3.0	51.1	57.7
50 Welcome	37.3	38.8	2.0	2.1	52.2	57.3
51 White Hungarian	32.9	34.0	2.2	2.6	49.3	56.7
52 White Poland	30.6	34.1	2.5	2.6	52.4	56.0
53 Brie Black	30.3	31.8	2.6	3.0	49.8	56.1
54 Rennie's Prize Cluster	35.0	39.0	2.5	2.3	51.3	55.2
55 Providence	30.0	34.1	2.4	2.7	38.5	53.9
56 Racehorse	34.4	38.0	3.0	2.2	57.9	53.7
57 Round or Branching Black	29.9	31.4	2.1	2.5	44.0	53.7
58 Flanders White	30.5	27.3	1.9	2.1	53.1	53.6
59 Dun	31.0	32.4	2.5	2.5	39.6	53.6
60 Thurigen	27.3	30.3	2.1	2.8	47.1	53.5
61 Prolific Black	29.0	30.9	2.4	2.3	57.7	53.4

TABLE XXIV. Yields of 81 varieties of Oats for four years—*Continued.*

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre (bushel 34 lb.)	
	1892.	Average 3 years 1890-91-92.	1892.	Average 4 years 1889-90-91-92.	1892.	Average 4 years, 1889-90-91-92.
	lb.	lb.	tons.	tons.	bush.	bush.
62 Bertram Prolific	29.3	33.8	2.4	2.9	35.9	**52.5**
63 Longfellow	32.9	35.4	1.8	2.6	42.1	**52 0**
64 Hamilton	30.0	34.6	2.1	2.8	36 6	**51.5**
65 Yellow Flanders	27.4	31.1	2.0	2.6	47.1	**51.4**
66 Port Adelaide	36.6	39.5	2.4	2.2	54.2	**51.0**
67 Early Racehorse	37.3	40.2	2.2	1.9	47.2	**50.7**
68 Longfellow	31.0	33 3	2.5	2.8	43.0	**50.2**
69 Potato	30.3	33.3	2.4	2.6	46 7	**50.0**
70 Scotch Potato	31.0	33.8	1.8	2.5	35.1	**49.9**
71 Dun	29.0	32.5	1.9	3.2	36.0	**49.4**
72 Angus	33.3	35.1	2.6	2.5	50.2	**49.2**
73 Triumph	33.6	32.0	2.1	2.3	53.5	**48.4**
74 Birlie	31.8	36.0	2.3	2.6	35.2	**47.9**
75 Australian White	36.5	38 3	2.3	2.2	47.1	**46.8**
76 Improved Scotch	32.8	33.5	2.3	2.6	42.1	**46.5**
77 Hopetown	31.0	31.4	2.3	2.8	37.2	**44.1**
78 Hungarian Black	25.5	29.5	2.3	2.0	42.7	**43.4**
79 Hopetown	25.0	31.8	2.4	3.0	26.5	**41.2**
80 Red Spot	21.5	27.4	2.1	2.5	20.5	**38.0**
81 Selected Winter	29.0	32.7	2.3	2.3	39.4	**36.8**
Average	31.87	34.36	2.41	2.50	53.93	**60.13**

Of the 81 varieties grown for four years the 9 leading kinds are all foreign. Only 15 of these varieties were from a Canadian source, and they include nearly all the old kinds. The Joanette Black, Chenailles Black, Black Etampes and Houdan Black, are very much the same in all essential characteristics, so much so, that the three first mentioned appear to be one and the same variety, though probably grown for some time in different localities in France previous to their importation. The straw is fairly strong but under medium in height. These varieties are, therefore, more suitable for sowing on good, rich land. They stand up fairly well, are not coarse, and are almost entirely free from rust tendencies. They are also inclined to shell easily when ripe. The hull is unusually thin and is easily removed in threshing. The 10 varieties which gave the highest yields for four years, made an average of 76.9 bush. per acre in 1892, and the 10 kinds which gave the lowest yields made an average of 44.2 bush. per acre. The 14 best yielding varieties for the four years have all a spreading head. The American Welcome, imported from Germany, gave the highest weight per measured bushel for the four years, viz., 40.9 lb. The heaviest weighing variety in 1892 was the early Blossom, imported from England. It weighed 41.4 lb. per bush. The lightest weighing variety was the Red Spot, imported from France, which in 1892 weighed but 21.5 lb. per bush.

TABLE XXV. Yields of 27 varieties of Oats for two years.

Varieties.	Weight per measured bushel.		Straw per acre.		Grain per acre (bush. 34 lb.).	
	1892.	Average 2 years '91-92.	1892.	Average 2 years '91-92.	1892.	Average 2 years '91-92.
	lb.	lb.	tons.	tons.	bush.	bush.
1 Golden Giant	26.5	28.6	2.1	2.3	62.2	**89.0**
2 Magnet	29.1	32.6	1.9	2.1	52.8	**86.4**
3 Vick's American Banner	28.9	32.9	2.2	2.1	66.7	**86.3**
4 Holstein Prolific	31.6	34.1	2.0	2.0	62.9	**86.0**
5 White Mane	30.5	32.9	2.2	2.3	59.4	**84.3**
6 White Schonen	31.5	33.0	2.1	2.1	60.9	**83.7**
7 Danish	30.0	33.0	2.1	2.1	61.8	**81.8**
8 Wide-Awake	34.5	35.1	2.1	2.0	64.5	**81.7**
9 Giant Swedish	28.5	29.9	2.2	2.1	63.3	**81.5**
10 Early Calder	32.1	33.4	2.2	2.1	64.2	**77.5**
11 Giant Yellow	34.1	34.6	1.7	2.0	50.9	**77.1**
12 Early Gothland	35.8	37.3	2.2	2.0	55.2	**74.1**
13 White Swiss	34.5	36.3	2.1	2.1	54.3	**72.6**
14 Black Mane	26.1	30.4	2.3	2.2	51.7	**72.0**
15 White Belgian	34.8	36.9	2.2	2.2	57.7	**70.0**
16 Black Glen Rothern	29.6	33.1	2.4	2.5	48.4	**69.9**
17 Early Archangel	36.3	38.2	2.0	2.2	47.2	**69.4**
18 Clydesdale	38.6	38.1	2.2	2.3	54.9	**68.4**
19 Steele's New White Cave	36.6	38.1	2.1	1.9	62.7	**68.3**
20 Japan	36.6	39.3	2.1	1.9	50.4	**66.9**
21 New Rosedale White	34.0	36.9	2.0	2.1	44.2	**66.8**
22 Carter's Early Black	29.6	30.2	2.0	.....	53.9	**65.3**
23 Canadian Triumph	38.9	40.6	1.9	1.7	44.5	**63.8**
24 Dakota	39.0	40.4	2.1	2.9	54.7	**63.3**
25 Victoria Prize White	40.5	40.5	2.1	2.0	51.1	**60.7**
26 Rennie's Prize White	38.6	40.2	1.9	1.8	49.7	**58.6**
27 Carter's Royal Cluster	36.5	37.3	2.1	2.1	51.6	**57.9**
Average	33.46	35.33	2.04	2.12	55.63	**73.44**

The Golden Giant at the head of the list, stands up well, is quite free from rust and possesses straw of average height. Although a good yielder the grain is light. The Magnet which was first in 1892, holds second place among the varieties grown for two years. Vick's American Banner, so well known in many parts of the Province, stands third in point of yield; for the two years it gave an average return of 86.3 bush. per acre.

TABLE XXVI. Yields of 8 varieties of Oats for one year.

Varieties.	Weight per measured bushel.	Straw per acre.	Grain per acre (bush. 34 lb.).
	lb.	tons.	bush.
1 American Beauty	34.8	2.8	**76.7**
2 Joanette	34.9	2.6	**74.8**
3 Abyssinian	36.5	2.9	**74.5**
4 Baltic White	30.9	2.5	**70.7**
5 Thousand Fold	33.3	2.6	**65.4**
6 Wilson's White Prolific	27.1	2.7	**59.3**
7 New Wonderful	34.4	2.4	**53.9**
8 Badger Queen	31.9	2.9	**52.5**
Average	32.98	2.68	**65.98**

All the varieties in the above list were grown here for the first time in 1892, except the Joanette, the seed of which was obtained from grain newly imported by a Toronto seedsman. This variety stands second in point of yield. It gave a return of 74.8 bush. per acre, which is but 1.7 bush. less than was obtained from the crop of 1892, grown for the fourth time from seed originally imported from France. The American Beauty, obtained in Ontario in the spring of 1892, gave 1.9 bush. more per acre than the Joanette.

10. Oats. Different Dates of Seeding.

The following table is a part of an experiment conducted simultaneously with barley, peas and oats, to ascertain the results from sowing them at different dates. The oats were sown in duplicate plots in 1891 and 1892 respectively, and each of the two plots contained a different variety. The plots were one one-hundred-and-sixtieth of an acre in size, and $2\frac{1}{4}$ bushels of seed were used per acre, sown broadcast.

Table xxvii. Comparative yields of Oats from different dates of seeding.

Dates of Seeding.	Weight per measured bushel.			Straw per acre.			Yield of grain per acre.		
	1891.	1892.	Average	1891.	1892.	Average	1891.	1892.	Average
	lb.	lb.	lb.	tons.	tons.	tons.	bush.	bush.	bush.
April 22nd	35.7	30.3	33.0	1.54	1.5	1.52	58.2	47.2	52.7
May 1st	36.2	27.5	31.9	1.47	1.6	1.54	68.0	45.7	56.9
May 9th	34.1	24.3	29.2	1.66	1.0	1.33	64.9	42.4	53.7
May 18th	32.4	22.5	27.5	1.53	2.3	1.92	49.7	33.9	41.8
May 26th	28.5	20.3	24.4	1.78	1.8	1.79	33.3	17.2	25.3
June 6th	24.9	7.8	16.4	2.00	2.0	2.00	23.4	11.3	17.4

It will be observed that the highest yields were obtained from the second and third seedings, respectively, in 1891, and from the first seeding in 1892, while the best average yields were obtained from the second seeding. The best weight of grain was obtained from the second seeding in 1891 and from the first seeding in 1892. But the best average weights were obtained from the oats of the first seeding, and the average weights continually decreased with each successive seeding.

11. Barley and Peas. Selection of Seed.

These experiments relate to growing barley from large selected grain, small grain, and broken grain, and also peas from large selected grain, and broken grain. The object was to ascertain the extent of the advantage of using choice seed as compared with inferior seed. The plots were but one rod square. The undertaking of these experiments was something of an afterthought. They were undertaken partly for the purpose of filling up a few small unused plots. Because of this they were sown late. Spring wheat and oats were also sown in suitable plots, but the weather in harvest so interfered with these last mentioned experiments, that we have not reported on them. We are convinced, notwithstanding, that we have entered upon a very important line of experiment, and hope to be able to give it much attention in future. It would not only be interesting but also profitable to know how many years the different species of grain can be grown upon the same soil without sensible deterioration; whether for a time at least improvement could not be effected by means of the selection of seed alone, and to what extent deterioration would be accelerated by sowing inferior seed. A series of experiments relating to these questions should be of much service.

TABLE XXVIII. Hulless Barley from different qualities of seed.

Kind of seed sown.	Yield of grain per acre.
Large grains	26.98 bushels.
Small grains	18.12 "
Broken grains	13.64 "

The lateness of the seed time prevented large yields from being secured in any case, but the difference in yield between the grain grown from the large seed and the small was no less than 8.86 bush. per acre in favor of the former. When we compare the returns from the broken seed, with that from the large seed, we find it was 13.34 bush. per acre in favor of the latter. It would, therefore, seem to be very important to sow large plump seed which has the broken grains taken out of it, so far as practicable.

TABLE XXIX. Peas from different qualities of seed.

Kind of seed.	Straw per acre.	Grain per acre.
Whole peas	1.54 tons.	25.92 bushels.
Cracked peas	.86 "	12.17 "

The remark made under Table XXVIII, in reference to the care that should be exercised in removing broken grain from barley that is to be used for seed, is even more applicable with peas. They are more liable to be broken with the machine than barley, and usually it is not found easy to separate them from the whole peas, but it should be done if possible, as in this experiment the difference in the returns from the whole seed, as compared with that from broken seed, was no less than 13.75 bush. in favor of the former.

12. BARLEY, PEAS, SPRING WHEAT AND OATS HARVESTED AT DIFFERENT STAGES OF MATURITY.

In this experiment 24 plots of barley, peas, spring wheat, and oats were sown, and cut at different stages of ripeness. Of these 12 were spring wheat, and there were 4 plots each of the other varieties of grain. As some features of the experiment are not yet completed, (as the analyzing of the grain and its behavior when used as seed), we do not think it prudent to say very much in regard to the experiment at this stage. It may be mentioned here, however, that the yields and the weights of the grain were not much influenced by being cut at different stages of ripeness.

(b) Cereals in Large Plots.

These were grown with the object of obtaining seed of promising varieties in quantities sufficient for a more general distribution through the country. They more generally consist of varieties that have been previously tested for three years. They cover an area of from 1-5 of an acre to 2 acres, according to the quantity of seed on hand. The whole area of spring grains covered by these plots was 30 acres. They were grown in fields numbers 6 and 12 respectively. In addition to the above, 66 acres were sown with grains in plots varying from 2 to 5 acres each. These larger plots were sown with various kinds of spring grains, which had given the most satisfactory results during the various previous

tests that had been made with them at this station. In one 20 acre field, which had produced oats the previous season, the seed barley obtained from the large plots was so marred by the presence of oats, which grew from seed that had remained in the land over winter, that it could not be used for the purpose intended. The said field had, notwithstanding, been gang-plowed, and again plowed late in the autumn, and cultivated in the spring before sowing the barley.

13. Barley on Large Plots.

The larger plots of barley covered in all about 21 acres. Of these 20 acres, comprising 6 varieties, were grown in field No. 1, in which some of the oats from the preceding crop, remained in the ground over winter. Hence the barley which grew on these plots could not be used for seed as mentioned above when speaking of grains grown on large plots. In field No. 12 the varieties were grown which are given in Table xxx below. These plots were preceded by a turnip crop.

Table xxx. Yields of varieties of Barley on one-fifth acre plots.

Varieties.	Yield per acre.
Kinnakulla	40.58 bushels (48 lb.)
Carter's Goldthorpe	36.87 " "
Pfanen	36.76 " "
Highland Chief	35.33 " "
Hungarian (Hulless)	35.15 " (60 lb.)

It will be observed that the Hungarian gave the largest yield, viz., 43.92 bus. per acre if we take 48 lb. as the standard bush. This variety also made a good showing in the list of grains grown for three years. The Kinnakulla stands second among 67 varieties grown in 1892.

14. Spring Wheat on large Plots.

The large plots of spring wheat covered an area of $5\frac{1}{2}$ acres. There were 7 varieties in all; of these 4 were acre plots, and 3 were half-acre plots. They were in field No. 12 and were preceded by a crop of roots.

Table xxxi. Yields of varieties of Spring Wheat on one acre and half-acre plots.

Varieties.	Yield per acre. (bush. 60 lb.)
Blue Stem	25.70
Holben's Improved	20.93
McCarlin	18.53
Red Fern	17.72
Pringle's Champion	17.17
Herison Bearded	15.00
Campbell's White Chaff	14.93

It will be observed that the Hayne's Blue Stem gave 1.5 bushels per acre more on the large plot than on the small plot. This is a promising variety, but has been tested only one year as yet at this station. The straw is quite strong and stands up well. The Holben's Improved gave 1.7 bushels less on the large plot as against the small.

15. Winter Wheat on Large Plots.

The large plots of winter wheat covered in all ten acres. They varied in size from one-half acre to two acre plots. There were 8 varieties in all. They were grown in field No. 6, which was at once plowed after the removal of the preceding hay crop. This field had grown hay for three years in succession. No manure was applied.

Table xxxii. Yields of varieties of Winter Wheat on large plots.

Varieties.	Yield per acre. (bush. 60 lb.)
Early Red Clawson	26.81
Jones' Winter Fyfe	26.14
Red Velvet Chaff	24.75
Bulgarian	21.81
American Bronze	21.52
Canadian Velvet Chaff	16.75
Galezien	15.95
Spalding Red	11.72

The early Red Clawson which stands first in the list in point of yield stands second among the varieties grown for three years. This variety seems to be adapted to a wider range of soils than some other sorts. The yields from Jones' Winter Fyfe are relatively larger in this test than in that of the smaller plots. Canadian Velvet Chaff holds relatively the same place. The two kinds which stand lowest in the lists are foreign varieties.

16. Oats on Large Plots.

The oats in large plots covered an area of 28⅔ acres. These varied in size from one-fifth of an acre to 5 acres. There were 14 varieties in all. Four varieties, viz, White Abundance, Probsteier, Golden Giant and Poland White, were grown in field No. 7. There were five acres of each variety. As these are not yet threshed we cannot report upon the yields. While each variety promises a good yield the Golden Giant was particularly attractive while growing, owing to the cleanness and strength of the straw. In plots of one acre each, 7 varieties were grown in field No. 12: these are White Abundance, Black Etampes, Siberian, White Tartarian, Flying Scotchman, Improved Waterloo and Bonanza. We cannot give yields of these as they are not threshed. The Flying Scotchman, an early ripening variety, and the White Bonanza, were very badly lodged. The other varieties promise a good return. In plots of one-fifth to two-fifths of an acre 7 varieties were grown in field No. 12. The previous crop was roots. The results of these are given in Table xxxiii below.

TABLE XXXIII. Yields of seven varieties of Oats in large plots.

Varieties.	Yield per acre. (bush.)
Siberian	60.40
Magnet	57.96
Improved Besthorn	57.16
Waterloo	54.61
Golden Giant	52.63
Danebrog	48.52
Black Poland	36.34

The Siberian which heads the list, also stands at the head of the list among the white varieties grown for four years. The Magnet, second in this test, also stands second among 27 varieties grown for two years.

POTATOES AND ROOTS.

Of potatoes 118 varieties were grown in 1892, and of roots 130 varieties. The size of the plots for potatoes was one-hundredth of an acre, and also for the different varieties of roots, but some plots relating to the cultivating of roots varied from the size just mentioned as will be more fully described hereafter. The potatoes were grown upon an old sod, plowed up after the hay crop had been removed from it in 1891. No manure had been applied for several years preceding. The aspect of the land was gently undulating, and the situation was rather fortunate in view of the wet weather which followed the crop. The soil may be designated a light colored loam. No fertilizers were applied in any form. The varieties of roots were grown upon soil where an old sod had been plowed under, after the removal of the hay crop in 1890. Potatoes followed in 1891. Fresh farm-yard manure was spread upon the ground in the winter of 1891-2, at the rate of about 15 tons per acre. The plots relating to modes of cultivation were on land which had grown cereals for three or four years in succession, followed by a crop of roots in 1891. The land was manured in the winter of 1889-90, with farm yard manure spread upon it, also at the rate of about 15 tons per acre. It may be designated a clay loam possessed of a fair amount of vegetable matter. The seed was from potatoes originally secured for the station from different parts of Ontario, Prince Edward Island, Nova Scotia, and the United States, and additional varieties were added in 1892, by securing seed in different parts of Ontario and the United States. The seeds of the different kinds of roots were obtained from England, the United States and Canada.

17. POTATOES. COMPARATIVE TEST OF 114 VARIETIES.

In 1892, 114 varieties of potatoes were grown. Two drills of each variety were planted, and the drills were all about 28 inches apart. The size of each plot was one one-hundredth of an acre. Twelve pounds of each variety of seed were used. The tubers were so cut that all the sets when planted were one foot apart in distance.

The sets when cut were somewhat uniform in size, but there was of course a difference in the number of eyes possessed by each. Flat cultivation was practically adopted. The potatoes were planted on May 14th. Table XXXIV gives the yield of 25 varieties grown for three years, Table XXXV of 16 varieties grown for two years, and Table XXXVI of 74 varieties grown for one year.

TABLE XXXIV. Yields of 25 varieties of Potatoes grown for three years.

Varieties.	Percentage of crop marketable.	Weight of 30 best developed potatoes.	Yield per acre, 1892.	Average yield per acre, 3 years 1890-91-92.
		lb.	bush.	bush.
1 Empire State	96.5	9.8	120.0	**168.6**
2 Summit	90.9	10.5	187.1	**160.6**
3 Thorburn	93.7	11.0	185.4	**148.0**
4 London	78.3	7.3	165.4	**138.0**
5 Clark's No. 1	88.5	7.8	127.1	**134.3**
6 Early Mane	77.1	6.3	112.9	**131.6**
7 Sweet St. Vernal	86.5	7.5	136.3	**123.9**
8 Rural New Yorker No. 2	88.6	7.3	113.8	**122.9**
9 Late Rose	85.8	7.3	129.2	**120.6**
10 Minister	94.3	8.5	130.8	**114.3**
11 Early Puritan	88.8	9.5	175.0	**113.8**
12 Pootaluck	89.1	7.0	80.0	**113.5**
13 Daisy	85.7	6.5	90.0	**108.5**
14 Rural Blush	94.3	8.8	95.0	**108.2**
15 Beauty of Hebron	87.2	6.5	74.6	**99.0**
16 Early Sunrise	80.9	7.3	104.6	**98.3**
17 Green Mountain	90.2	8.3	127.1	**96.9**
18 White Elephant	93.1	9.0	120.0	**93.4**
19 Rose's New Invincible	94.2	9.5	121.3	**90.7**
20 Dakota Red	92.1	8.5	100.4	**87.0**
21 Halton's Seedling	69.1	6.0	75.4	**86.4**
22 Early Ohio	82.2	7.0	107.5	**82.7**
23 Crown Jewel	88.6	9.8	135.0	**79.5**
24 Rosy Morn	85.7	7.8	87.5	**76.3**
25 Stray Beauty	83.0	5.3	80.8	**65.6**

The Empire State which stood at the head of the list in 1890 and 1891 does not occupy so high a place relatively in 1892, although it heads the list when the average for three years is considered. The Summit, a very excellent potato, maintains its claim to second place. The Thorburn, sixth in the list for 1890 and 1891 has third place in that for three years. These three varieties are also very good for table use.

TABLE XXXV. Yields of 16 varieties of Potatoes grown for two years.

Varieties.	Percentage of crop marketable.	Weight of 30 best developed potatoes.	Yield per acre, 1892.	Average yield per acre, 2 years 1891-92.
		lb.	bush.	bush.
26 Tonhocks	81.5	8.3	216.67	**154.99**
27 Convoy	89.1	8.3	153.33	**151.77**
28 Early Oxford	83.2	6.5	186.25	**138.33**
29 Badger State	92.5	11.0	110.83	**136.27**
30 Advance	83.9	8.5	147.08	**131.04**
31 Thunderbolt	84.0	9.0	185.00	**129.70**
32 Putnam	89.9	8.0	156.67	**128.19**
33 Kosh-Konong	91.2	10.0	142.50	**127.90**
34 Early Rochester	90.6	9.5	167.92	**126.81**
35 Early Rose	85.5	8.5	160.83	**126.27**
36 Woodbury White	86.8	8.0	176.67	**120.59**
37 Silver King	85.8	7.8	161.25	**119.68**
38 Hoffman	77.7	6.5	166.25	**113.68**
39 Early Dominion	80.0	7.0	127.08	**100.04**
40 Ohio Junior	84.4	7.0	130.42	**100.01**
41 Queen of the Valley	89.8	8.8	110.00	**88.80**

Tonhocks, the seed of which was obtained in the United States in 1891, heads the list. It is a good potato for the table, and this is also true of the Convoy which stands second in the list. Both varieties are at least medium in size.

TABLE XXXVI. Yields of 73 varieties of Potatoes grown one year.

Varieties.	Country obtained from.	Percentage of crop marketable.	Weight of 30 best developed potatoes.	Yield per acre, 1892.
			lb.	bush.
42 Munro Co. Prize	United States.	84.3	10.0	180.33
43 Mammoth Pearl	"	93.2	9.5	171.25
44 Island McDonald	P. E. Island	96.3	12.8	166.67
45 Burbank's Seedling	United States.	85.8	7.0	164.17
46 King of Rose	"	80.2	7.8	161.67
47 Negro	"	68.2	5.5	158.75
48 Prince Albert	Nova Scotia	85.8	8.5	155.42
49 Molly Star	United States.	74.7	6.5	154.58
50 Red Australian	Ontario	90.8	8.5	154.17
51 Halo of Dakota	United States.	77.7	6.3	153.33
52 Early Everett		84.8	7.8	153.33
53 Early Germ	United States.	90.6	9.3	150.00
54 Polaris	Ontario	76.8	7.0	147.50
55 The Dandy	United States.	82.7	7.5	146.67
56 Hotel Favorite	"	82.6	8.0	146.25
57 Chautauqua	"	93.7	8.5	145.42
58 Eureka	"	83.6	7.3	145.00
59 Thorburn's Extra Early	Ontario	78.2	6.0	145.00
60 Watson's Seedling	United States.	74.7	6.5	145.00
61 St. Patrick	Nova Scotia	89.7	9.0	141.67
62 Delaware	United States.	89.0	7.5	139.58
63 Everett's Seedling		80.4	6.3	138 33
64 The Polaris	United States.	83.1	9.3	135.83
65 P. E. I. Early Rose	"	90.8	7.8	135.42
66 Chicago Market	"	80.9	7.8	135.00
67 The Rosedale	Ontario	81.7	6.3	134.18
68 Red Australian	"	91.8	9.0	132.50
69 Sunlit Star	"	70.9	5.8	131.67
70 Paris Rose	United States.	67.8	5.8	130.83
71 Mount Carbon	"	89.7	7.8	129.17
72 Landreth's Farmers' Alliance	"	88.9	8.8	127.92
73 The Ideal		75.7	6.5	126.67
74 Alexander's Prolific	United States.	90.4	6.3	121.60
75 Landreth's State of Maine	"	88.3	7.5	120.83
76 Morning Star	"	78.5	6.8	118.38
77 Harbinger	"	52.5	5.0	118.33
78 Rose Seedling	"	92.2	9.5	117.92
79 Barpee's Extra Early	Ontario	74.4	6.3	117.08
80 Snow Queen	United States.	79.4	7.0	115.00
81 Chas. Downing	"	65.2	4.8	115.00
82 Snowflake	"	58.7	4.3	115.00
83 Bella A. C		93.1	7.0	114.18
84 Vick's Champion	United States.	89.8	8.0	114.17
85 Extra Early Vermont	"	70.2	5.3	111.67
86 Dempsey's Seedling		82.3	7.0	110.42
87 Garnets	Nova Scotia	71.6	7.8	108.75

TABLE XXXVI.—*Concluded.*

Varieties.	Country obtained from.	Percentage of crop marketable.	Weight of 30 best developed potatoes.	Yield per acre, 1892.
			lb.	bush.
88 Early May Flower	United States	66.9	5.0	105.83
89 Dakota		94.8	10.0	103.33
90 State of Maine	United States	92.2	7.0	100.83
91 Early Market	"	85.3	6.8	96.67
92 New Queen	Nova Scotia	90.4	10.5	95.83
93 N.B.&G. Co's. Grand Mogul	United States	89.0	5.8	90.83
94 White Star	Ontario	79.6	8.3	90.00
95 Royal Adelaide	Nova Scotia	80.1	5.3	90.00
96 Landreth's Garfield	United States	69.9	5.5	90.00
97 Pearce's Prize Winner	Ontario	89.3	8.0	89.08
98 Early Essex	United States	69.0	6.3	88.75
99 Lady Finger	Ontario	39.3	4.0	87.08
100 Hopeful	United States	77 6	6.0	83.75
101 McIntyre	Nova Scotia	85.5	8.3	83.33
102 Ohio Junior	United States	74.5	5.3	78.33
103 Boley's Northern Spy	"	79.5	6.5	75.42
104 Mammoth Pearl	"	83.8	6.8	75.00
105 Wilson's First Choice	"	59.9	4.8	73.75
106 White Lily	"	72.5	5.3	69.58
107 Vick's Perfection	"	85.0	6.8	63.75
108 Edwards	Ontario	78.3	6.0	59.58
109 Woodbury White	United States	79.5	6.3	35.83
110 May's Imperial	"	66.7	4.5	25.00
111 Vaughan	"	86.7	5.3	18.75
112 I. X. L	Ontario	81.4	5.0	17.92
113 Belle	Nova Scotia	96.4	5.5	11.67
114 May's Peerless	United States	60.0	3.3	10.42

The Munro Co. Prize potato, which heads the list of 73 varieties grown in 1892, came from the United States. Though a considerable portion of the potatoes from this variety were quite large, they were more uneven in size than those from some other varieties. The Mammoth Pearl, which stands second, came from the same country. They are a more even sample than the former. But this variety did not produce so many large potatoes. The Island McDonald, the seed of which was obtained from Prince Edward Island, although it gives a yield of 14 bush. per acre less than the Munro Co. Prize, produced larger potatoes, larger indeed than those produced by any other variety. They were also more even in sample than the Munro Co. Prize.

18. POTATOES. DIFFERENT DEPTHS OF PLANTING SEED TUBERS.

This experiment was a duplicate of that carried on in 1891, and described in the Report for that year, p. 87. It relates to planting to the depth of 1, 3, 5 and 7 inches, respectively. The test was carried on in duplicate both years. Each plot was one one-hundredth of an acre in size. The drills as in the case of the potatoes of different varieties, were 27.7 inches apart and the sets were placed one foot apart in the drill. The cultivation was practically flat. One set of plots was planted May 14th and the other May 28th.

TABLE XXXVII. Comparative yield of Potatoes from different depths of planting.

Depth of planting.	Average yield per acre of two plots, 1891.	Average yield per acre of two plots, 1892.	Average, 1891-2.
	bush.	bush.	bush.
1 inch	160.7	147.1	153.9
3 "	188.4	152.1	170.3
5 "	224.2	153.8	189.0
7 "	256.1	158.5	207.3

In this exceedingly interesting line of experiment, it will be observed that the yield increased in every instance, with the increase in the depth of planting, and the ratio of increase was somewhat marked. But the difference in favor of deeper planting was considerably more last year than this, owing very probably to the drier season of 1891. It should also be mentioned that although the deeper planting gave the best yields, it also necessitated the bestowment of more labor in planting and digging.

19. POTATOES. PREPARATION OF SEED TUBERS.

An experiment was carried on in duplicate in 1892 to ascertain the results from the preparation of seed tubers in different ways and from different modes of planting the same. In each experiment ten plots were used. The soil, including the preparation, was the same as in the varieties previously described. The drills were also the same distance apart, viz., 27.7 inches, and the planting was likewise done on May 14th. The varieties used were the Prince Albert and Royal Adelaide. The experiment as will be observed from Table XXXVIII below, relates to the use of sets of different sizes, uncut and cut, to sets cut with a different number of eyes, and to the planting of sets of the whole potatoes at different distances apart.

TABLE XXXVIII. Yields of Potatoes from seed tubers prepared differently.

	Amount of seed used per acre.	Yield per acre.	Yield per acre, less seed.	Percentage of whole crop marketable.
	bush.	bush.	bush.	bush.
Large, whole, 1 foot apart	134	239	105	75.1
" " 2 feet "	68	160	92	81.9
" " 3 " "	46	127	81	86.0
Medium " 1 foot "	54	189	135	83.1
" " 2 feet "	27	110	83	87.7
Small " 1 foot "	22	93	71	83.7
Medium, cut in two, 1 foot apart	25	105	80	82.5
" two eyes in piece, 1 foot apart (without seed ends)	14	77	63	87.3
" one eye " " "	7	39	32	81.0
" seed ends, 1 foot apart "	4	32	28	73.8

It will be observed in the above experiments that when the seed has been deducted, the best yield was obtained from the medium whole potatoes, planted one foot apart, and the next best from large whole potatoes planted a similar distance. These remarks will apply to both experiments. All things considered the best results were obtained from the medium whole potatoes planted one foot apart. The smallest potatoes were obtained from the seed ends and from the large potatoes respectively, which had been planted one

foot apart and this is true of both experiments. The best quality of product was obtained from planting medium whole potatoes two feet apart, and the second best from medium potatoes cut with two eyes in each seed tuber and planted one foot apart. But it should be remembered that these are results of tests conducted for but one year. Further experiments in the same line may give different results.

20. Potatoes. Different Dates of Seeding.

In this experiment potatoes were planted at two different dates, viz.: May 14th and May 28th. The soil was the same as that given to the different varieties; the distance between the drills was also the same, viz.: about 28 inches. The seed tuber was cut so that each section possessed two eyes, and flat cultivation was adopted. The Empire State potato was used.

Table xxxix. Yields of Potatoes from planting seed tubers at different dates.

Date of seeding.	Yield per acre.
May 14th	161.8 bushels.
May 28th	143.8 "

It is not safe to draw conclusions from this experiment until it is repeated and on a more extensive scale.

21. Potatoes. Application of Fertilizers.

In this experiment thirteen different fertilizers were used as enumerated in table xl below. The ground on which these crops were grown was the same in character as that already described in Section 17. Each plot comprised one two-hundredth of an acre and the experiment was carried on in duplicate. The drills were 27.7 inches apart. In planting sets were used which contained two eyes each, and they were placed one foot apart in the drill. The seed was covered at the depth of about three inches. The planting was done May 20th, and the fertilizers were sown in the drills after the seed had been dropped, but before it was covered. The sodium nitrate and muriate of potash were used at the rate of 160 lb. per acre, wood ashes unleached 800 lb. per acre, and all the other different fertilizers at the rate of 325 lb. per acre.

Table xl. Yields of Potatoes grown by aid of fertilizers.

Fertilizers.	Yield of potatoes per acre.
Royal Canadian	208.7 bush. per acre.
Potato manure	178.3 "
Superphosphate (animal)	159.6 "
Pure bone meal	154.6 "
Bone and Potash	154.2 "
Superphosphate (mineral)	147.1 "
Reliance	135.0 "
Nitrate of Soda	127.5 "
Capelton	124.6 "
Sure growth	123.8 "
Wood ashes	122.1 "
Muriate of Potash	116.3 "
Victor	111.3 "
No fertilizer	105.0 "

It will be noticed that the unfertilized plot gave the lowest yield. All the fertilizers used increased the yield, but in very different degrees. In some instances this increase was very marked. But we refrain from drawing conclusions until these experiments have been repeated.

22. Swede Turnips. Comparative Test of 44 Varieties.

In 1892, 44 varieties of Swede turnips were grown. The plots were in size one-hundredth of an acre. The drills were 27.7 inches apart, and the seed was sown June 15th. The ground was plowed in the autumn of 1891, and top-dressed in the winter of 1891-92 with fresh farmyard manure, at the rate of 15 tons to the acre. It was again plowed in the spring, that the fresh manure might be buried, and was harrowed more or less. Table XLI gives the yield of 36 varieties for 2 years, and table XLII of 8 varieties for one year.

Table XLI. Yield of 36 varieties of Swede Turnips for two years.

Varieties.	Soundness of roots when harvested.	Length of neck.	Yield of tops per acre, 1892.	Average weight per root.		Yield of roots per acre.	
				1892.	Average two years.	1892.	Average two years.
			tons.	lb.	lb.	tons.	tons.
1 White Swede	Good	Short	5.98	2.51	2.53	25.13	22.53
2 Hazard's Improved	Medium	Medium	5.00	2.48	2.70	19.50	21.31
3 Sutton's Champion	Good	Long	4.58	2.14	2.55	19.03	21.29
4 Our Selected Purple Top	"	Medium	3.90	2.08	2.49	19.45	21.20
5 Green Top	"	"	6.18	2.27	2.44	21.35	21.05
6 Hartley's Bronze Top	Poor	"	4.00	1.82	2.37	17.96	20.95
7 Bangholm	Good	"	5.00	2.00	2.40	20 00	20.73
8 Westbury's Improved	"	Long	6.05	2.10	2.31	20.80	20.26
9 Marshall's Purple Top	Poor	"	4.05	1.73	2.32	16.70	20.24
10 P. W. & Co's. Imperial Prize, P. T.	Medium	"	6.88	2.05	2.45	19.90	19.78
11 Carter's Imperial Hardy	Good	Short	4.10	1.83	2.31	18.18	19.64
12 Carter's Prize Winner	"	Medium	3.60	1.75	2.21	17.45	19.48
13 Lang's Improved	"	Short	3.88	1.74	2.17	17.78	19.38
14 Skirving's Swede	"	Long	3.78	1.62	2.19	16.00	19.37
15 King of Swedes	"	"	4.83	1.82	2.35	16.00	19.18
16 East Lothian	"	Medium	3.75	1.62	2.19	16.15	18.84
17 Sharp's Improved	"	"	3.10	1.55	2.11	15.30	18.73
18 Sutton's Champion	"	Long	5.58	1.84	2.27	18.95	18.66
19 Highland Prize, P. T	"	"	5.43	2.10	2.31	17.25	18.63
20 Knowfield	"	Short	3.80	1.73	2.29	15.60	18.56
21 Hall's Westbury	Medium	Long	4.45	2.00	2.14	18.95	18.17
22 Royal Norfolk P. Top	Good	Short	3.00	1.67	2.19	13.93	18.02
23 Maston's Purple Top	"	Long	5.75	1.76	2.11	17.03	17.94
24 Fetticairn Green Top	Medium	"	5.15	1.84	2.18	17.10	17.36
25 Carter's Elephant	Poor	"	4.88	1.95	2.25	15.95	17.36
26 Drummond's Imperial	Good	"	5.20	1.92	2 22	16.50	17.10
27 Hazard's Improved	"	Medium	4.05	1.96	2.20	14.68	16 24
28 White Rock	Medium	"	2.90	1.45	1.78	14.35	15.76
29 Marquis of Lorne, P. T	Good	Long	4.65	1.91	2.02	16.20	15.68
30 Aroostock's Improved	"	Medium	3.65	1.54	1.86	12 33	15.14
31 White Sweet Russian	Poor	"	3.80	1.42	1.89	13.53	15.08
32 Carter's Elephant	"	Long	4.08	1.63	1.87	14.63	14.95
33 Budlong's White Ruta Baga	Medium	Medium	2.65	1.57	1.77	14.40	14.93
34 Ashcroft's Purple Top	"	Long	3.15	1.45	1.87	12.73	14.89
35 Carter's Elephant	"	"	3.33	1.33	1.74	12.65	14.06
36 Bruce's Selected East Lothian	"	"	2.93	1.44	1.80	11.15	13.91

The White Swede stands at the head of the list of the varieties grown for two years, although in 1891 its place was but tenth in the list of varieties grown for that year. It is short in the neck, large in size and firm in flesh. Carter's Elephant did rather poorly

this year again, notwithstanding the large yield obtained from it in 1890. We learn, however, from the co-operative experiment carried on throughout the Province that generally it gave good yields in 1892.

TABLE XLII. Yields of 8 varieties of Swede Turnips for one year.

Varieties.	Soundness of roots when harvested.	Length of neck.	Weight of tops per acre.	Average weight per root.	Yield of roots per acre.
			tons.	lbs.	tons.
37 Novelty Swede, No. 1	Medium	Medium	7.78	2.13	**21.00**
38 Novelty Swede, No. 2	"	Short	4.45	1.92	**20.30**
39 Queen of Swedes	"	"	5.80	1.90	**19.50**
40 Aroostock's Ruta Baga	"	Long	6.35	1.92	**19.00**
41 Shamrock Swede	Good	"	5.00	1.79	**17.30**
42 Crimson King	Medium	Medium	4.15	1.74	**17.25**
43 Laidlaw's Improved	"	Long	3.48	1.78	**16.95**
44 Rennie's Prize, P.T.	Good	Short	4.08	1.79	**15.23**

In 1892, 8 varieties of Swede turnips were grown for the first time at this station. The Novelty Swede No. 1, first in the list in the above table, comes third in the list of all the varieties grown in 1892. It is somewhat peculiar that a variety which grows so large an amount of top relatively as this turnip produced, should yield so well. The Novelty Swede No. 2, second in the above list, stands fifth among the varieties grown in 1892.

23. SWEDE TURNIPS. THINNING PLANTS IN THE DRILL.

The experiment, of which the above is but a part, relates to Swede turnips, fall turnips, mangels and carrots, grown at different distances in the drill, the drills being all the same distance apart, viz., 27.7 inches. The results given are the average of three experiments, except in the plot of each variety left unthinned, when but one plot was grown. Roots were grown upon the same land in 1891 except where the fall turnips were grown, in which case the turnips were preceded by corn. Barley was grown in 1890. A liberal supply of manure was applied to the land before the barley crop was grown, but none was applied since that time. The ground was plowed late in the autumn of 1891. It was ridged moderately, and the seed was sown.

TABLE XLIII. Yields of Swede Turnips thinned to different distances in the drill.

Distance between Swedes in drills.	Average weight per root.	Weight of tops per acre.	Weight of roots per acre.
	lbs.	tons.	tons.
Unthinned	0.20	3.96	7.65
8 inches	1.60	4.62	20.54
12 "	1.76	3.65	16.89
16 "	2.18	3.28	15.41
20 "	2.44	3.54	14.00

It will be observed that the largest yield was obtained from the rows with plants thinned to 8 inches in the row, and that the yield decreased in every instance with the increase in distance between the plants in thinning. Two of the roots in the drills with plants thinned to 20 inches were about equal to 3 of these from rows thinned to 8 inches. The unthinned plants were so small as to be of comparatively little use for winter feeding, and the yields were correspondingly small.

24. Swede Turnips. Different Distances Between the Drills.

The experiment, of which the above is but a part, relates to Swede turnips, mangels and carrots, grown upon drills at different distances apart. The roots in all the drills were thinned to the same distance. The results given are in every instance the average of two experiments. Explanations regarding the previous cropping, manuring, and preparation of the soil are given in section 23.

Table xliv. Yields of Swede Turnips grown upon drills different distances apart.

Distance between drills.	Weight of tops per acre.	Average weight per root.	Weight of roots per acre.
	tons.	lb.	tons.
20 inches apart	4.17	1.43	16.56
26 "	5.08	1.80	17.31
32 "	4.10	2.22	16.88

These plots were grown in duplicate as already stated. Five of the ten rows in each plot were thinned to 16 inches between the plants, and the remaining five to 8 inches. The best average yields were obtained from 26 inches, although the variations in yield were less marked than in the size of the roots.

25. Fall Turnips. Comparative Test of 18 Varieties.

There were 18 varieties of fall turnips grown in 1892. These are also sometimes designated as white and sometimes as yellow fleshed. Two rows of each variety were grown 27.7 inches apart, and the plots were one-hundredth of an acre in size. The drills were slightly ridged and the seed was sown on June 21st. The crop of 1891 where these turnips were grown was corn, and that of the preceding year barley. The ground was plowed late in the autumn of 1891, and again in May, 1892. Fresh farmyard manure was applied, at the rate of 15 tons per acre, in the spring of 1892, and just before the last of the two plowings mentioned above. Table xlv relates to 14 varieties grown for two years, and table xlvi to 4 varieties grown for one year.

Table xlv. Yield of 14 varieties of Fall Turnips grown for two years.

Varieties.	Color of flesh.	Shape of roots.	Soundness of roots when harvested.	Yield of tops per acre.	Average weight per root.		Yield of roots per acre.	
					1892.	Average for two years.	1892.	Average for two years.
				tons.	lb.	lb.	tons.	tons.
1 Jersey Navet	White..	Long oval.	Spongy..	4.35	2.08	2.91	21.38	**24.81**
2 Greystone	"	Oval	Good	6.50	1.76	2.66	18.40	**23.24**
3 Red Globe Norfolk	"	Round	"	4.68	1.78	2.73	17.78	**23.24**
4 Greystone Improved	"	Broad oval.	"	8.18	1.90	3.10	16.20	**22.74**
5 Purple Top Maine	"	Oval	"	6.58	1.93	2.71	19.33	**22.71**
6 Early American P. T.	"	Flat	Medium..	5.10	2.03	2.40	21.50	**21.80**
7 Red Top Strap Leaf	"	Very flat..	"	4.35	1.65	2.40	16.00	**20.99**
8 Early Purple Top Munnick	"	"	Good	.95	1.65	2.37	15.75	**20.80**
9 Pomeranian White Globe	"	Round	Medium..	8.75	1.51	2.26	16.90	**20.55**
10 Orange Jelly	Yellow.	"	Good	3.90	1.32	2.35	13.15	**18.59**
11 White Stone	White..	Flat	Medium..	4.03	1.91	2.32	15.10	**17.35**
12 Golden Ball	Yellow.	Oval	Good	4.20	1.50	2.12	11.85	**16.72**
13 Yellow Aberdeen G. T.	"	"	"	4.13	.99	1.69	8.43	**13.22**
14 Yellow Aberdeen P. T.	"	"	Medium..	5.13	.98	1.60	8.60	**12.93**

The Jersey Navet which heads the list for two years for productiveness, came from the United States, as did the Early Purple Top. The Jersey Navet was not so firm in flesh as the four varieties which stand next in order of yield. The Red Globe Norfolk which stands third in point of yield is first amid the varieties grown for three years.

TABLE XLVI. Yields of 4 varieties of Fall Turnips grown for one year.

Varieties.	Color of skin.	Shape of roots.	Soundness of roots when harvested.	Yield of tops per acre.	Average weight per root.	Yield of roots per acre.
				tons.	lb.	tons.
15 Purple Top Mammoth or Improved Greystone	Purple	Oval	Good	4.70	1.73	**14.38**
16 Purple Top Mammoth	"	Mostly oval	Spongy	4.15	1.66	**13.70**
17 Imperial Green Globe	Green	Round	Good	2.75	1.32	**10.90**
18 Purple Top Hybrid	Purple-yellow	Long	Medium	2.65	1.00	**6.20**

The Purple Top Mammoth or Improved Greystone which heads the list, and the Purple Top Mammoth which comes second, may possibly be one and the same variety, and both may be the same as the Greystone Improved, which stands fourth in the list of those grown for two years. Sometimes change of name on the part of seedsmen and others leads to confusion in distinguishing varieties.

26. FALL TURNIPS. THINNING PLANTS IN THE DRILL.

In this experiment the turnips were thinned to five different distances and in one instance were left unthinned. Explanations regarding the previous cropping, manuring and preparation of the soil are given under section 23.

TABLE XLVII. Yields of Fall Turnips thinned to different distances in the drill.

Distance between turnips in drill.	Average weight per root.	Weight of tops per acre.	Weight of roots per acre.
Unthinned	.39	12.93	14.24
4 inches	1.02	8.05	19.61
8 "	1.59	6.66	17.57
12 "	2.15	5.44	16.03
16 "	2.71	5.09	15.06
20 "	2.97	4.53	13.19

It will be observed that the highest yields were obtained from the plants thinned to 4 inches in the row, and that the yields decrease in every instance with the increase in distance in the thinning of the plants. While the best yields were obtained from the plants thinned to 4 inches, bulbs were too small to handle conveniently for winter storage. The yields from the unthinned plants were large relatively when compared with those obtained from the unthinned Swedes contained in table XLIII. This would tend to sustain the wisdom of the practice of sowing fall turnips broadcast to furnish pasture for live stock, more especially sheep and lambs late in the season.

27. MANGELS. COMPARATIVE TEST OF 38 VARIETIES.

There were 38 varieties of mangels grown in 1892. The plots were one-hundredth of an acre in size. The drills were made 27.7 inches or three and a half links

apart. The mangels were sown April 30th. Table XLVIII gives the particulars which relate to 31 varieties grown for two years and table XLIX those which relate to 7 varieties grown for one year.

TABLE XLVIII. Yields of 31 varieties of Mangels for two years.

Varieties.	Color of roots.	Shape of roots.	Yield of roots per acre, 1892.	Average weight per root.	Yield of tops per acre.	Yield of roots per acre. Two y'rs 1891-92.
			tons.	lb.	tons.	lb.
1 Carter's Champion Yellow Intermediate	Yellow	Medium long.	25.78	2.72	4.93	**29.94**
2 Improved Mammoth Prize Long Red	Dark red	Long	20.65	2.33	4.45	**28.11**
3 Evan's Improved Mammoth Sawlog	Red	"	21.35	2.44	4.28	**27.68**
4 Steele Bros'. Long Red Selected	Dark red	"	21.03	2.41	4.40	**27.18**
5 Carter s Mammoth Long Red	"	"	25.80	2.42	6.25	**26.49**
6 Elvetham Long Red	"	Medium long.	27.20	2.29	6.00	**26.27**
7 Mammoth Red Intermediate	Pale red	"	27.20	2.42	5.83	**26.22**
8 Norbitan Giant	Red	Long	19.9	2.34	4.48	**25.99**
9 New Monarch	"	Long-oval	25.85	2.33	6.65	**25.54**
10 Eiffel Tower	Pale red	Long	18.78	2.24	4.30	**25.41**
11 Colossal Long Red	Red	"	19.65	2.17	5.20	**24.66**
12 Yellow Obendorf	Yellow	Globe	20.00	1.69	3.40	**24.41**
13 Long Red Selected Stock	Dark red	Long	19.05	2.13	4.78	**24.40**
14 Giant Holstein	"	"	17.90	2.10	5.00	**23.94**
15 Chirk Castle	Pale red	Medium long.	18.95	2.02	4.00	**23.82**
16 May's Mammoth Long Red	Red	Long	23.03	2.18	6.63	**23.17**
17 Oblong Giant Yellow	Yellow	Globe	17.05	2.04	2.55	**23.02**
18 Yellow Oval-shaped Giant	"	Oval	18.40	2.02	2.50	**22.35**
19 Long Oxhorn	Deep red	Long	15.30	1.92	4.65	**21.25**
20 Carter's Warden Orange	Orange	Globe	15.15	1.80	5.85	**20.91**
21 Red Oval-shaped Giant	Red	Oval	13.35	2.02	2.85	**19.22**
22 Mammoth Golden Giant	Yellow	Globe	13.98	1.82	4.58	**18.52**
23 Golden Tankard	Dark yellow	Oval	15.10	1.63	2.90	**18.20**
24 Yellow Globe	Yellow	Globe	17.43	2.38	4.95	**17.96**
25 Oblong Giant Red	Red	Medium long.	11.43	1.94	2.78	**17.57**
26 Red Globe	Dark red	Globe	12.98	1.61	2.68	**17.44**
27 Clark's Devon Orange Globe	Orange	"	12.98	1.49	2.23	**17.26**
28 Fisher Hobb's Orange Globe	"	"	12.03	1.53	1.78	**17.05**
29 Kniver Yellow Globe	Pale yellow	"	13.75	1.52	1.88	**16.53**
30 Long Yellow	Yellow	Long	10.53	1.73	2.80	**15.99**
31 Red Tankard	Dark red	Globe	13.53	1.52	1.90	**14.81**

Carter's Champion Yellow Intermediate, first in the above list, gives a yield of 998 bushels per acre for the two years. The seed originally came from England. As the name implies it is only intermediate in length. The Improved Mammoth Prize Long Red, which stood at the head of the list in point of yield in 1891, produced an average of 937 bushels per a acre for the two years. It is a very long variety. The first in point of yield of the Globe varieties, the Yellow Obendorf comes twelfth in the list of the 31 varieties. It gave a return of 813.7 bushels per acre. The 13 long varieties gave an average yield of 24.6 tons per acre, and the ten Globe varieties a yield of 18.8 tons.

TABLE XLIX. Yields of 7 varieties of Mangels for one year.

Varieties.	Color of roots.	Shape of roots.	Yield of tops per acre.	Average weight per root.	Yield of roots per acre.
			tons.	lb.	tons.
32 Sutton's Mammoth Long Red	Red	Long	5.48	2.04	**20.23**
33 Beck's Champion Giant	Yellow	Medium long.	3.13	1.81	**17.40**
34 Sutton's Golden Tankard	"	Globe	3.33	1.74	**17.23**
35 Canadian Giant	Dark red	Long	4.85	1.63	**16.10**
36 Gate Post	Pale yellow.	Medium long.	3.00	1.45	**13.53**
37 Sutton's Berkshire	Yellow	Globe	2.13	1.38	**13.08**
38 Sutton's Yellow Intermediate	Orange	"	1.35	1.03	**9.50**

The seed of Sutton's Mammoth Long Red was obtained from England. It not only stands at the head of the list but has nearly three tons per acre more roots than the variety following next to it, and also gave 75 per cent. more tops per acre than was obtained from this variety. It is worthy of note that the relation between the yields of the tops and the yields of the roots is comparatively close. None of these newer introductions have been found any improvement as yet over some of the older sorts which have been tried for years past.

28. Mangels. Thinning Plants in the Drill.

In this experiment the mangels were thinned to five different distances and were also left unthinned. Explanations regarding the previous cropping, manuring and preparation of the soil are given under section 23.

Table L. Yields of Mangels thinned to different distances in the drills.

Distance between mangels in drills.	Average weight per root.	Weight of tops per acre.	Weight of roots per acre.
	lb.	tons.	tons.
Unthinned	0.16	7.86	15.45
8 inches	1.34	5.12	19.32
12 "	1.54	3.73	15.57
16 "	1.88	3.64	14.78
20 "	2.36	3.71	15.01

The best yields in this instance were obtained from the mangels thinned to 8 inches in the row, the second best from those thinned to 12 inches and the third best from those unthinned; but the last mentioned were practically of no use for winter storage. The size of the plants increased with the increase in distance between the rows.

29. Mangels. Different Distances Between the Drills.

In this experiment the mangels were grown upon drills different distances apart. The drills were slightly ridged and then seed was sown May 27th, 1892. Explanations regarding the previous cropping, manuring and preparation are given in section 23.

Table LI. Yields of Mangels grown upon drills different distances apart.

Distance between drills.	Average weight of tops per acre.	Average weight per root.	Average weight of roots per acre.
	tons.	lb.	tons.
20 inches	3.99	1.66	22.72
26 "	4.82	1.83	20.08
32 "	4.32	1.95	17.90

These plots were grown in duplicate as already stated. Five of the ten rows in each plot were thinned to 8 inches in the row, and the remaining five to 4 inches. It will be observed with the mangels as with the turnips, that the most satisfactory returns were obtained from the drills which were 26 inches apart.

30. Carrots. Comparative Test of 23 Varieties.

There were 23 varieties of carrots grown during 1892. The plots were one-hundredth of an acre in size. The distance of the drills apart was 27.7 inches. The

carrot seed was sown April 30th. Table LII relates to the yields of 23 varieties grown for but one year, as the carrot crop was not a success in 1891, owing to the lack of the germination of the seed, caused by dry weather at the critical time.

TABLE LII. Yields of 23 varieties of Carrots for one year.

Varieties.	Color of roots.	Length of roots.	Labor in pulling.	Average weight per carrot.	Yield of tops per acre.	Yield of roots per acre.
				oz.	tons.	tons.
1 Improved Short White	White..	Medium..	Easy	15.6	10.2	**37.3**
2 Pearce's Improved Half Long White	" ..	" ..	"	15.6	10.2	**36.5**
3 Large White Vosges	" ..	Short	"	13.8	8.5	**33.9**
4 White Green Top Orthe	" ..	Medium..	"	14.3	7.8	**32.6**
5 Simmer's Short White Vosges	" ..	" ..	"	13.9	7.4	**32.3**
6 Large White Belgian	" ..	Long	Hard	13.9	9.5	**32.2**
7 Mastodon	" ..	Medium..	Easy	13.3	8.1	**31.8**
8 Danver's Orange	Red....	" ..	"	12.5	5.5	**30.4**
9 P. W. & Co's. Improved Giant White	White..	Long	Medium..	14.8	11.2	**29.9**
10 Giant Wiltshire	" ..	"	Hard	11.7	10.2	**29.2**
11 Sutton's Yellow Intermediate	Yellow.	"	Medium..	13.6	7.1	**28.0**
12 Guerande	Red....	Short	Easy	10.1	4.7	**27.0**
13 Scarlet Intermediate	"	Medium..	Medium..	11.0	5.8	**26.5**
14 Half Long Stump Rooted	"	Short	Easy	9.6	4.8	**25.8**
15 French Intermediate	"	Medium..	"	9.4	6.7	**25.5**
16 Mitchell's Perfected	"	" ..	Medium..	10.5	4.4	**25.2**
17 Carter's Orange Giant	Yellow.	Long	Hard	11.0	5.2	**25.2**
18 Sutton's Improved Intermediate	Red....	"	Medium..	8.9	4.9	**22.0**
19 James' Scarlet Intermediate	" ...	Medium..	" .	8.3	4.1	**22.0**
20 Improved Large, Long Red Altringham	"	Long	Hard	8.1	9.1	**19.6**
21 Long Orange	"	"	"	7.3	9.3	**18.0**
22 Yellow Belgian	Yellow.	"	"	8.8	5.4	**17.7**
23 Long Red Surrey	Red....	"	"	7.1	3.5	**17.1**

It will be observed that the yields of the carrots in the above table are unusally large. They run from 570 bushels per acre to 1,243, an average of 906 bushels per acre. The 7 best yielding varieties are all white, and the 5 best yielding sorts were all easy to pull. The 4 poorest yielding sorts were all hard to raise. The variety called the Improved Short White is a grand field carrot. It is of medium length, sound in flesh, smooth in shape and easy to harvest and handle.

31. CARROTS. THINNING PLANTS IN THE DRILL.

In this experiment the carrots were thinned to five different distances, and were also left unthinned. Explanations regarding the previous cropping, manuring and preparation of the soil are given under section 23.

TABLE LIII. Yields of Carrots thinned to different distances in the drills.

Distance between carrots in drills.	Average weight per root.	Weight of tops per acre.	Weight of roots per acre.
		tons.	tons.
Unthinned	.07	8.28	15.60
2 inches	.36	7.13	20.06
4 "	.53	5.33	15.19
6 "	.62	4.12	12.10
8 "	.67	3.61	9.94

The largest yield was obtained from the carrots thinned to two inches in the row, and the second largest from the unthinned plants. The yield from the carrots thinned to

but 2 inches in the row, although only about half as large as those thinned to 8 inches, gave more than twice the yield.

32. Carrots. Different Distances Between the Drills.

In this experiment the carrots were grown upon drills different distances apart. The drills were slightly ridged and the seed was sown May 27th, 1892. Explanations regarding the previous cropping, manuring and preparation of the soil are given under section 23.

Table liv. Yields of Carrots grown upon drills different distances apart.

Distance between drills.	Average weight of tops per acre.	Average weight per root.	Average weight of roots per acre.
	tons.	lb.	tons.
20 inches	6.56	.52	**23.43**
26 "	6.85	.55	**21.55**
32 "	6.06	.56	**17.14**

These plots were grown in duplicate as already stated. Five of the ten rows in each plot were thinned to 2 inches in the row, and the remaining five to 4 inches. It will be observed that the most satisfactory returns were obtained from the carrots grown with a distance of 20 inches between the drills.

33. Sugar Beets. Comparative Test of 10 Varieties.

In 1892, 10 varieties of sugar beets were grown. The distance between the drills was the same as that for other roots. The plots were also the same size, viz., one-hundredth of an acre each. The drills were raised slightly and the seed was sown April 30th. Table lv gives information regarding 10 varieties grown for one year. Particulars relating to the returns from an acre of the variety tested in Ontario during recent years for sugar making are given later.

Table lv. Yields of 10 varieties of Sugar Beets for one year.

Varieties.	Color of roots.	Shape of roots.	Uniformity of roots.	Yield of tops per acre.	Average weight per root.	Yield of roots per acre.
				tons.	lb.	tons.
1 White Silesian	White	Long	Good	6.93	1.83	**17.70**
2 Red Top	Pinkish white.	Medium long.	"	5.05	1.77	**17.63**
3 Vilmorin's Improved White	White	Long	Medium	7.13	1.66	**16.28**
4 French White	Pinkish white.	"	"	2.83	1.63	**16.25**
5 Lane's Improved	Pink	"	Good	3.28	1.58	**16.20**
6 Champion	"	"	"	4.83	1.45	**13.93**
7 Austria Electorial Wohanka	White	Medium long.	Medium	5.95	1.29	**12.13**
8 Kleinwanz Lebei	"	"	"	4.75	1.03	**10.05**
9 Improved Imperial	"	Oval	Poor	5.20	1.07	**9.75**
10 Red Skinned	Pink	Medium long.	Medium	4.33	.89	**8.58**

The White Silesian gave a yield of 17.70 tons per acre. This variety is more commonly grown for feeding uses. Vilmorin's Improved White, which has third place this year, stood first among the varieties grown in 1891. This beet, it will be observed, is a producer of tops.

SILAGE AND FORAGE CROPS.

The experiments made under this head include those carried on with fodder corn, various mixtures of grain for fodder, rape, millet, clover and grasses.

As there is no branch of agriculture at the present time in reference to which there is so general a desire for information as that of growing corn and making silage, we have thought it best to go over the whole matter, giving more especially that which is of practical value. The information given has been drawn largely from our own experience, but this has been enlarged by that of farmers both in this country and the United States, and by details furnished by the different experiment stations, which have issued bulletins on the subject. Our aim will be to make the question so clear and concise, if possible, that any farmer, who is disposed to follow the methods laid down, will be able to grow corn and cure the same in the silo, and even build the silo itself.

In this country corn is beyond all doubt pre-eminently the crop for the silo, for the reason, first, that it can be preserved so perfectly and so certainly in the silo when the work is properly done, and secondly, it is so difficult to cure in any other way. Nearly all kinds of the other fodder crops can be cured so readily as to make it at least an open question, as to whether the practice of making them into silage should become general. Green rye and the second cutting of red clover should probably form exceptions, as the former is more palatable when made into silage, and the latter may in damp seasons be more easily cured in the silo, especially in conjunction with corn. We succeeded in making good rye silage in the summer of 1891, by cutting it at the blossoming stage, tramping it down firmly in the silo, and afterwards weighting it to some extent, but found difficulty when feeding it, owing to the rapidity with which the silage dried on the exposed surface.

34. Fodder Corn. Comparative Test of 73 Varieties.

In 1892, 73 varieties of corn were grown. The seed was obtained chiefly from the United States, and some was obtained from Ontario. All the varieties were grown in duplicate. Where the first series of plots were planted a crop of barley was grown on the ground in 1891, preceded by a crop of rape in 1890. The ground was enriched with an application of about 15 loads of fresh farm-yard manure in the spring of 1890, just before the ground was plowed for rape. This crop was grown in field No. 18, which is considerably elevated. The corn was planted on May 14th, 1892, the size of each plot was three two-hundredths of an acre, and there were three rows of each variety.

Where the second series of plots were grown the land had produced corn in 1891, planted on overturned sod, which had not been broken for five or six years previously. Fresh farm-yard manure was applied in the spring of 1892, at the rate of 15 tons per acre. These plots were located in field No. 14, which lies somewhat low. The crop was planted on May 28th, 1892. The difference in the time of planting was designed. Each plot comprised one-hundredth of an acre, and contained but one row of corn. In both experiments the soil was plowed somewhat early in the spring, and was occasionally stirred with a spring tooth cultivator until the time of planting. In both instances the corn was planted in drills and in squares, the drills being 5 links (39.6 in.) apart each way. Eight grains were planted in each hill, and after the corn was well above ground the number of plants was reduced to five in each hill. Thorough shallow cultivation was given the corn in both directions in the two experiments. Table LVI gives the average results from plots grown in duplicate in 1891, and also in 1892. Table LVII gives those from 9 varieties grown in duplicate plots in 1892.

It will be observed (Table LVI.) that the two varieties which stand at the head of the list as to weight of fodder have given an average yield of 22.2 and 20.0 tons per acre, respectively, but as they are about the latest among the varieties in maturing, and also do not produce much grain in this climate, it is at least questionable whether even in the southern part of Ontario these will prove suitable for the silo, owing to their lateness. The Thoroughbred White Flint, which we have grown for three years, and which has become comparatively well known in some sections of the province, stands seventh in point of yield. Though somewhat earlier

TABLE LVI. Yields from 64 varieties of Fodder Corn for two years.

	Varieties.	Kind of Corn.	Condition of grain when harvested.	Average height of plants.	Yield of ears per acre when harvested.	Average weight per ear when harvested.	Average yield of crop per acre, 1892.	Average yield of crop per acre, 1891-1892.
				ft. in.	lb.	oz.	tons.	tons.
1	Mammoth White Surprise	White Dent	Water	10 10½	1,894	3.8	25.2	22.2
2	Brazilian Flour	White Flint	"	9 10	484	1.4	22.6	22.0
3	Chester Co. Mammoth	Yellow Dent	"	10 4	2,340	3.5	21.6	20.9
4	Mastodon Dent	"	Late milk	10 4	5,717	6.8	20.0	20.0
5	Blunt's Prolific	White Dent	Early milk	10 10¾	2,508	3.8	20.8	20.0
6	Cloud's Early Yellow	Yellow Dent	Dough	9 9½	6,898	6.8	19.2	20.0
7	Thoroughbred White Flint	White Flint	"	8 9½	3,494	4.8	19.8	19.9
8	Sheep's Tooth	White Dent	Early milk	9 8	4,013	5.1	22.6	19.7
9	Mammoth S. Fodder	Sweet	"	8 5½	3,885	5.3	19.4	18.8
10	Improved Leaming	Yellow Dent	Dough	9 7½	6,321	5.5	21.2	18.8
11	Leaming Field Corn	"	"	9 4½	6,365	6.2	19.1	18.5
12	Giant Prolific S. Ensilage	White Dent	Water	10 11	3,565	4.9	24.2	18.4
13	Horsetooth	Yellow Dent	Dough	10 2¼	5,915	5.5	21.5	18.4
14	Mammoth Cuban	"	Mature	9 3½	7,708	3.7	19.1	18.1
15	Golden Beauty	"	Dough	9 6½	5,571	5.3	21.0	17.8
16	Virginia Horsetooth	White Dent	Water	9 11¾	1,711	2.8	21.8	17.8
17	Mammoth Southern Sweet	"	Early milk	10 4½	2,962	3.9	22.6	17.8
18	Centennial White	"	Milk	8 11	6,117	5.9	19.1	17.3
19	Yellow Western	Yellow Dent	"	9 6½	5,275	5.4	18.6	17.1
20	Red Cob Ensilage	White Dent	Early milk	10 4½	2,592	3.9	20.1	17.0
21	Mammoth W. Cob Ensilage	"	Water	10 7	2,721	3.7	20.3	16.6
22	Salzer's South Dakota	Yellow Flint	Mature	7 7	6,330	5.0	16.7	16.5
23	Salzer's North Dakota	White Flint	"	7 9½	5,375	4.8	17.0	16.3
24	Northern White Pearl	White Dent	Dough	8 4	7,550	7.0	18.0	16.0
25	Salzer's Sup. Fod. Ensilage	"	Early milk	10 2	2,677	4.1	18.7	15.9
26	Leaming Yellow	Yellow Dent	.....	.....	5,817	5.6	18.5	15.9
27	Improved Clarage	"	Mature	9 5	6,365	6.0	17.8	15.6
28	Evergreen Sweet	Sweet	Late milk	8 2	4,309	5.1	18.9	15.5
29	Hickory King	White Dent	Early milk	10 7¼	1,954	2.9	20.9	15.5
30	Hickox Sweet	Sweet	"	7 11½	4,996	5.5	19.7	15.5
31	Clark's Co. Champion	White Dent	Milk	8 10	5,175	5.4	17.8	15.3
32	Large White Flint	White Flint	.....	.....	5,758	5.0	17.1	15.2
33	Compton's Early	Yellow Flint	Mature	7 0½	6,275	5.7	13.1	15.2
34	Tuscarora	White Flint	Dough	7 4	6,211	6.0	19.2	15.1
35	Egyptian Sweet	Sweet	Milk	9 2	2,888	3.9	15.0	15.0
36	Wisconsin Earliest W. Dent	White Dent	Dough	8 1½	6,990	7.0	15.8	14.8
37	Queen of the Prairie	Yellow Dent	"	7 5	5,792	5.2	15.3	14.6
38	White Flour	White Flint	"	8 0	3,377	3.9	15.9	14.6
39	Longfellow	Yellow Flint	Mature	7 10	5,636	4.7	14.3	14.4
40	Wisconsin White Dent	White Dent	"	8 8	7,094	6.8	17.8	14.4
41	Early Butler	Yellow Dent	Dough	7 9½	7,502	6.8	13.9	14.1
42	Stowell's Evergreen Sweet	Sweet	Late milk	7 9½	4,071	4.6	16.8	14.0
43	Sweet Fodder	"	Dough	7 10½	3,673	4.7	16.6	13.9
44	Early Adams or Burlington	White Dent	"	8 0	5,546	5.1	16.6	13.8
45	Angel of Midnight	White Flint	Mature	7 8	5,129	4.7	15.0	13.4
46	Old Colony	Sweet	Dough	7 4½	4,619	4.6	15.5	13.2
47	Marblehead Mammoth	"	"	6 8½	4,702	5.0	15.7	13.2
48	Pride of the North	Yellow Dent	Mature	7 11	5,709	5.1	14.6	13.0
49	Golden Dewdrop	Yellow Flint	"	7 7½	5,613	5.0	13.9	13.0
50	Dakota Dent	Yellow Dent	"	7 10	5,892	5.4	13.0	12.9
51	Late Mammoth Sweet	Sweet	Milk	7 2½	3,375	5.3	11.7	12.8
52	Golden Dent	Yellow Dent	Mature	7 7	5,175	5.0	13.5	12.5
53	Wauskakum	"	"	6 9	5,229	4.5	11.5	12.4
54	Early White Flint	White Flint	"	7 1	5,563	5.3	13.3	12.2
55	Queen of the North	Yellow Dent	"	7 6½	5,431	4.1	13.1	12.2
56	Canada Yellow	Yellow Flint	"	7 2½	5,069	5.0	12.7	12.1
57	King of the Earlies	Yellow Dent	"	7 1½	5,846	5.3	13.1	11.8
58	Self-Husking	Red Flint	"	6 6	5,011	4.4	12.1	11.1
59	Minnesota King	Yellow Dent	"	7 0½	5,565	5.1	12.1	11.0
60	100 day Corn	Yellow Flint	"	7 2	.....	4.8	13.0	10.9
61	Rideout or Mercier	"	"	6 6	5,113	5.3	10.0	10.1
62	Crosby	Sweet	Dough	6 5	4,690	4.4	12.4	10.1
63	Smutnose	White Flint	Mature	5 9½	5,444	5.4	9.4	10.0
64	Pearce's Prolific	Yellow Flint	"	7 0	4,140	4.6	13.0	9.7

than the varieties mentioned above, it is rather late in maturing for this section. The Mammoth Cuban, which stands fourteenth in the list, came earliest to maturity among the large varieties. It matured sufficiently for the silo, and produced the highest weight of ears of all the varieties at the time of harvest. The Salzer's South Dakota, a yellow flint variety, and Salzer's North Dakota, a white flint, stand 22nd and 23rd respectively in the list. They were the largest of the Flint varieties which produced matured corn. These are promising varieties. The Canada Yellow, the variety which was almost exclusively grown in former years for the grain, stands fifty-fifth in yield for fodder uses. Compton's Early, thirty-third in the list, is an early-maturing variety. It produces a goodly quantity of well-matured grain.

In view of the experience of the past, we would recommend the following varieties as suitable for the silo, viz., the Thoroughbred White Flint, the Mammoth Cuban, Salzer's South Dakota, Salzer's North Dakota, Wisconsin Earliest White Dent, and Compton's Early. But it should be remembered that they are not equally well adapted to all parts of the province, as some of them mature much earlier than others. Yet it is at least probable that the latest ripening kinds mentioned will mature sufficiently in the more southerly latitudes of Ontario.

TABLE LVII. Yields from 9 varieties of Fodder Corn grown for one year.

Varieties.	Kind of corn.	Condition of grain when harvested.	Average height of plants.	Yield of ears per acre when harvested.	Average weight per ear when harvested.	Average yield of whole crop per acre, 1891-1892.
			ft. in.	lb.	oz.	tons.
65 Giant Beauty	Yellow Dent.	Milk	10 6	9,467	8.8	26.4
66 Dr. Woodhull	"	Late milk	9 8	6,896	6.9	21.8
67 New Leaming	"	Dough	9 11	8,413	7.9	21.7
68 N. B. & G. Co's. Giant Fodder	White Dent	Water	10 1½	3,454	4.8	20.6
69 Mammoth	Sweet	Early milk	8 8½	6,384	6.2	20.5
70 Pride of Kansas	Yellow Dent.	Milk	10 2	4,521	5.4	20.4
71 Silver Flint	White Flint	Mature	7 10	8,088	7.2	20.3
72 True Leaming	Yellow Dent.	Dough	9 11	7,884	8.0	19.6
73 Wilson's White Prolific	White Dent	Late milk	9 3	6,521	6.5	17.9

Giant Beauty, which stands at the head of the list, has given the largest total yield per acre of the 73 varieties grown in 1892. It also has given the largest weight of ears of all the varieties at the time of harvest; and the weight of the largest ear was greater than that obtained from any other sort. In height it was surpassed by but 5 kinds. As, along with other good qualities, it is medium in maturing, it may turn out to be a valuable corn to grow in this province for ensilage. The Dr. Woodhull, which stands second in point of yield, is also a variety of considerable promise. The seed of these two sorts came from the Western States. The Silver Flint, which stands seventh in the list, matured perfectly, and besides giving a fair yield for food, produced a large quantity of well-matured ears.

THE SEED. As the power of germination in the seed of corn is easily destroyed, care should be taken to secure seed which may be implicitly relied on to start well under average conditions. The purchase of seed should receive attention sufficiently early to enable the grower to test the germinating power of the seed sometime before it is wanted for use. Of several methods that might be given the following is perhaps the most reliable and satisfactory: Plant a number of grains taken promiscuously from the lot in some soil in a box. The earth should be simply ordinary soil, as it is quite as important to note the character of the germination as to vigor as to know the seed will germinate. It should be kept moist, and at a temperature similar to that of the closing days of May. As only the most perfect ears should be chosen in selecting seed corn, and as it must be

thoroughly ripened before it can be relied on to grow, it is only in limited sections of the province that it will be worth while for the farmers to try and save their own seed. There are some sections, however, where the growing of seed might assume the dimensions of an industry, in view of the large quantities that will be wanted when corn for the silo comes to be generally grown.

Soil. Corn prefers a deep, rich, warm, dry, mellow soil, but will grow well in a variety of soils. Its favorite soils are rich loams, sandy or even gravely in texture. On humus soils it grows vigorously, but is a little later in maturing. It is not so well adapted to stiff clays, but fairly good crops may be grown even on these, providing a good, vigorous germination can be secured. As corn is a cleaning crop it may with advantage be grown on fields that have become foul with weeds. It will usually do well on clover sod, and the sod of old pastures, but in the latter instance there is some danger of disturbance to the crop from the ravages of the cut-worm which is so frequently found in such soils.

Preparation of the Soil. The mode of preparing the land for corn will, to some extent, depend upon the place given to it in the rotation. When it is to follow a grain crop the land should be plowed as soon as possible after the grain has been removed, with a view to aid in cleaning the land. To still further effect this object, it may be well to harrow or cultivate once or twice before the final plowing late in autumn, which in nearly all soils may be or perhaps should be deep. In spring thorough and frequent surface cultivation should be given to secure good tilth, and also the retention of ground moisture, and to encourage the sprouting of weed seeds with a view to their subsequent destruction. The more the weeds can be thinned before the planting of the corn the less proportionately is the labor required to effect this afterwards When the corn is to be planted on an old sod the ground should be plowed late in autumn or early in the spring, to give opportunity to the frost and other weathering influences to improve the tilth. When it follows clover sod, the plowing may be deferred till near the time of planting the corn. The clover will then have grown considerably, and the new growth thus formed will tend to hasten the decay of organic matter in the soil for the sustenance of the crop of corn.

Fertilizers. Farm-yard manure is probably the best fertilizer for corn that can be used, where it can be obtained in sufficient quantities. The quantity to apply will depend on the poverty of the land, natural and acquired, the nature of the soil and the frequency of the application. Not more probably than 15 tons per acre should be applied in any case, and more especially where the land is leachy, lest some of it be lost. Frequent applications of manure in moderate quantities are decidedly preferable to heavy applications but seldom given. When available the manure may be applied in the autumn. When in the fresh state it may be applied before the final autumn plowing unless the the soil is decidedly leachy, when it should be retained upon the surface. When decomposed it should generally be spread upon the surface, but to this there may be some exceptions. When fresh manure is applied in the spring it should be plowed in early or otherwise incorporated with the soil, to give time for fermentation. Artificial fertilizers may serve a useful purpose in many localities, but before using them freely we should determine by actual test with small quantities whether our lands will be adequately benefited by them, and if so by which kinds. It is more than doubtful if a formula could be given for applying them that would be of much value, owing to great variations in our soils. Co-operative experiments carried on in New Hampshire have demonstrated that both phosphoric acid and potash are required by the average soil of that State. They have demonstrated in Massachusetts that potash is most wanted; in Ohio, that nitrogen is as much wanted as either of the other two; and in Michigan, that artificial fertilizers are so little required as yet by the soils of that State in growing corn as to make their general application of doubtful utility. As potash is largely concerned in increasing the woody portions of the stalk in corn, we are safe in saying that our Canada wood ashes would stand us in better stead when strewn upon our corn fields than when sold at a low price to be used in growing corn in the various States of New England.

Planting. The time for planting corn for the silo varies with the climate, locality, soil and sometimes with the variety of the corn. It will range betwen May 10th and June 5th. Uusually it is considered more safe not to plant corn until the soil has become warmed to the temperature of 52° to 54° Fahrenheit, as registered by a thermometer buried in the soil as deeply as the seed is to be planted. There is much difference of view as to whether it is preferable to plant in hills or drills. In our experience we have obtained the largest yields of stalk from the drills, while the hills have given somewhat more grain. All things considered we favor cultivation in drills. The distance of the drills apart may vary from 36 inches with the smaller varieties to 45 inches with the larger. The distance of the plant in the drill will also depend upon the kind of corn, and to some extent upon the character of the soil, as corn should be more thinly planted on rich than on poor soils. The amount of seed required will therefore depend very much upon the kind of corn used. The influence of planting at different distances between the rows, and at different distances of plants apart in the row, is brought out in the following experiment:

35. Fodder Corn. Different Distances Between Drills and Between Plants in the Drills.

In this experiment three varieties of corn were grown, an early, a medium, and a later variety. Each variety was grown at different distances between the drills, viz., 30, 36 and 42 inches respectively, and the corn in each set of the drills planted at the distances mentioned above was also planted at different distances apart in the drill, viz., 4, 8 and 12 inches respectively. Two grains of seed were put in where but one plant was desired, and where necessary one plant was removed from each place when about three inches high.

In this experiment all the varieties were grown on triplicate plots, and each of the test plots comprised several rows. The soil where one set of these tests was made had been in sod for three summers. It was plowed in the autumn and planted on May 31st. No manure was used in this test. The second set of these tests was grown upon land which had produced a crop of corn in 1891, preceded by a crop of barley in 1890. Fresh farm-yard manure was applied before the crop of barley was sown, at the rate of 15 tons per acre. The planting took place on May 31st. The third set was grown upon land which had produced a crop of millet in 1891, and a crop of roots in 1890. Fresh farm-yard manure was applied in the spring of 1892, at the rate of 15 tons per acre. The corn was planted on June 1st.

As in giving directions for planting corn as to distances, it had been customary, to some extent at least, to recommend the same distance somewhat arbitrarily, for all kinds of corn, without regard to variety, this experiment was undertaken to ascertain the effects of distance upon variety when growing corn for the silo, and also to glean other items of importance relating thereto. Table LVIII. gives the average results of the triplicate experiment with each variety of corn, and also the average of the results from 31 kinds of corn. This triplicate experiment includes in all 81 plots.

This experiment shows, first, that in every case the highest total yield was obtained from planting in drills 30 inches apart and thinning to 4 inches in the drill, and second, that in every instance the largest yield of green ears was obtained from planting in drills 42 inches apart and thinning to 12 inches in the drill. All things considered, it also indicates so far as we can draw conclusions, in the absence of analysis of the corn: 1. That the best results were obtained in growing the Mammoth Southern Sweet in drills 42 inches apart, and the plants 12 inches apart in the drill. 2. That with the Wisconsin Early White Dent the best results were obtained from the corn grown with 30 inches between the drill, and 12 inches between the plants in the drill. 3. That with Compton's Early the best results were obtained from the corn grown with 30 inches between the drills, and 4 inches between the plants in the drill. It will also be noticed that the thickest seeding of Compton's Early gave within .32 tons per acre of whole crop, less than the thinnest seeding of Mammoth Southern Sweet, while it gave 1.85 tons of ears per acre more than the latter.

TABLE LVIII. Yields of fodder-corn grown at different distances between the drills and between the plants in the drills.

Variety.	Distance between drills.	Distance between plants.	Average weight per ear.	Yield of ears per acre.	Yield of whole crop per acre.
			oz.	tons.	tons.
Mammoth Southern Sweet.	30 inches	4 inches.	3 64	1.34	27.00
		8 "	3.64	1.66	22.64
		12 "	4.50	1.97	21.57
	36 inches	4 "	3.44	0.87	20.76
		8 "	4.36	1.83	21.31
		12 "	5.59	2.05	19.86
	42 inches	4 "	3.91	1.35	22.68
		8 "	4.54	2.01	21.33
		12 "	5.60	2.14	20.92
Wisconsin Earliest White Dent.	30 inches	4 inches.	5.05	4.94	24.97
		8 "	7.22	4.49	19.27
		12 "	10.15	5.05	17.92
	36 inches	4 "	4.99	3.78	19.87
		8 "	8.44	4.76	18.96
		12 "	11.11	4.44	17.00
	42 inches	4 "	5.75	4.68	21.41
		8 "	8.96	4.63	18.82
		12 "	11.76	4.59	15.99
Compton's Early.	30 inches	4 inches.	4.78	3.99	20.60
		8 "	6.32	4.09	17.11
		12 "	7.88	4.07	16.52
	36 inches	4 "	4.41	3.45	17.06
		8 "	7.14	4.14	16.30
		12 "	8.59	3.74	15.55
	42 inches	4 "	4.90	3.79	16.35
		8 "	7.57	4.06	15.38
		12 "	8.69	3.92	15.31
Average of the Three Varieties.	30 inches	4 inches.	4.49	3.42	24.19
		8 "	5.73	3.41	19.67
		12 "	7.51	3.70	18.67
	36 inches	4 "	4.28	2.70	19.23
		8 "	6.65	3.58	18.86
		12 "	8.43	3.41	17.47
	42 inches	4 "	4.85	3.27	20.15
		8 "	7.02	3.57	18.51
		12 "	8.68	3.48	17.41

It may also be mentioned here, that the seed in all the experiments of 1892 was planted to the depth of 1½ inches, but in general the depth to which the seed should be planted will vary with the soil and seasons and the time of planting. It should be shallow in moist seasons on cold soils, and in any case where it is planted early, lest more or less of the seed perish, but under the opposite conditions it may be put in as deeply as two inches on an average. In some countries corn planters made for the purpose are used but in Canada corn is usually planted with the ordinary grain drill, using only such o'

the tubes as may be necessary. The ground should be rolled before the planting of the seed, and in dry weather just after as well.

Cultivation. The cultivation consists of harrowing, horse-hoeing, and in some instances hand-hoeing. The object of the harrowing is to encourage weeds to germinate with a view to destroying them, to destroy those which have germinated, and so to stir the surface soil that aeration will be more complete and the ground moisture intercepted and held near the surface. Sometimes the harrow is used once and sometimes twice before the seed appears, and it is usual to give two harrowings after the corn is well above the ground. The harrow should not be used after the corn is from 5 to 7 inches high. The harrows most suitable are broad, to cover a wide space of ground, light to be easily drawn, with the teeth numerous to stir the weeds well, and short to disturb the roots of the corn, but small and slanting backwards rather than forward, so that the corn will not be much disturbed. The cultivator should then stir the soil between the rows or hills not seldomer than once a week, until the corn commences to tassel. After that period further cultivation may unduly retard the ripening process. Shallow cultivation is preferable. It may be several inches deep at first, but should gradually become more shallow. The cultivator should at no time seriously interfere with the cutting or breaking of the rootlets of the corn. The cultivating may be done by using one or two horse cultivators, but in the latter stages of the work only one horse cultivators can be used. We prefer to use both kinds of cultivators. Where noxious weeds are to be exterminated some hand-hoeing may be necessary in the line of the row.

Harvesting the Corn. The crop is in the best condition for harvesting when the corn in the ear has reached what is known as the glazed state, but where there is a large amount to be harvested the work had better begin when the grain is in the late milk stage lest some of it should become too ripe. Some advocate cutting corn with hooks and some with the mowing machine. A limited number have tried a reaper with elevators attached, and high enough to deliver the corn into a waggon driven alongside. This way of harvesting corn may yet become common, although it can scarcely be said to be completely satisfactory as yet. We have used a sled made by one of the graduates of the college. It consists of two flat runners 5 ft. 2 in. long and bevelled in front like the runners of a stone boat. They are made of hardwood and are $2\frac{3}{4}$ inches broad, and 5 inches high. They are kept in place by three cross pieces. Over this frame is a covering of inch boards 2 ft. 6 inches wide. The knives consist of two pieces of hardwood shaped somewhat like a V, with a piece of an old crosscut saw bolted on the outer edge of each, which is sharpened and cuts the corn when the sled is in motion. The knives are hinged on a bolt in front and the rear part may be pushed under the platform to adjust the width of the boat to any variation that may be found in the width of the rows of corn. The knives are held in position at the rear by a bolt which may be removed at will. The length of the knife is 20 inches, and the narrowest width at base $9\frac{1}{2}$ inches; the greatest width is 16 inches. Four stakes are placed in position, and a rope attached to these a short distance above the platform. The feet of the two men who stand inside are protected by this rope from any danger that might arise of being wounded in case of falling off in front of the knife. The drawing attachment is a bail of an old scraper. The two men who stand upon the platform catch the corn as it falls, and lay it down in sheaves on each side of the boat. A boy rides the horse. From 6 to 8 acres may thus be cut in a day.

Practical men are nearly all agreed that wilting is not necessary before putting the corn in the silo, and that it is a decided disadvantage in handling the corn when rain falls upon it after it is cut, owing to the unpleasantness of the work, and it is injured to some extent for cutting, and possibly also for food, by the soil and sand which adheres to it. Our experience in wilting corn has not proved entirely satisfactory.

For drawing the corn to the silo any form of low truck with a flat rack, or an ordinary rack, will answer very well. The top of the rack should not be much higher than the wheels. Sometimes two scantlings or poles with head pieces at both ends are suspended to the front and hind axles of a waggon at any desired height. Boards are then placed across these to make a platform on which the corn is loaded. With us both methods have given satisfaction.

Filling the Silo. Although corn may be preserved in the silo, without running it through a cutting box, the method of preserving it thus has not found much favor, as it is not easy to put such corn in the silo; it is difficult to pack it so as to exclude the air, and even more difficult to get it out to feed it to the stock. The cutting box should be strong, and of sufficient capacity to take the corn as fast as it can be brought from the field We have used one made, with the knives on the fly-wheel, and another with the same on the cylinder. We prefer the latter. The power used may be tread or sweep horse power or steam. Carriers are attached to the cutting box to convey the corn into the silo to any desired height or distance. The more elevated the position of the cutting box in relation to the silo, the less the power required. It is yet an unsettled question as to the lengths to which the corn should be cut. These vary in practice from $\frac{1}{2}$ inch to 2 inches. The argument in favor of short lengths maintains that the corn packs more closely, handles more easily in the silo, has less tendency to make sore the mouths of the cattle in eating it, and that there is less of it rejected by them in the manger. The long cuts are advocated on the ground of economy of labor and time in handling the corn, and that the silage is relished just as well by the stock. It may be stated here that the variety of the corn and the climate in which it is grown, so far influence the succulency of the stalks as to render it unsafe to fix upon any length that would be the most suitable under all circumstances, but the $\frac{3}{4}$ inch cut which is our own practice seems to receive the majority of votes at the present time.

Labor is saved when the corn falls as nearly in the center of the silo as possible, or in the centre of each compartment. It also renders it easier to mix the heavy and light portions. This is important to preserve the equilibrium in moisture, and also in the feeding quality of the silage. The silage should be kept well spread. There is as yet much difference of opinion as to the value of tramping and the amount of this that should be given. Some favor much tramping, others almost none. Amid this conflict of opinion it will probably be found that when the corn is kept about level in the silo, that sufficient tramping around the sides and in the corners to secure even settling of the silage is all that is required. If the corn is tramped too firmly around the walls so as to lie more compactly than in the center. it will sink more in the center. Thus the silage will be drawn away from the walls, making an air space. We favor moderate tramping.

The question is now pretty well determined that filling may be rapid, and continuous or periodic as may be convenient. Equally good results have been obtained from both methods. Our experience is in favor of rapid filling, all things considered, as it is economical of labor.

Various modes have been adopted of covering the silo when filled, but there appears to be no method practised as yet which proves uniformly satisfactory. Some cover to the depth of from 6 to 18 inches with green marsh hay run through the cutting box, cut straw and chaff, which should be tramped. Others use tar paper covered with boards, or chaff or straw, sometimes weighted and sometimes not, and yet others put no covering on at all. It is premature to say which of these methods is best under all circumstances. The results from them thus far have been variable. It is at least questionable if there is economy in using any kind of covering all things considered, as the silo, when left in this condition soon coats over with a white mould several inches thick, and so forms its own covering. This is the practice of some leading authorities, who have found that the attendant waste varies from 6 to 12 inches. A favorite covering with us is old fence corner hay cut and wetted, which contains a large percentage of fine grass, and therefore lies compactly.

The Silo. In locating the silo much will depend upon the arrangement of the outbuildings already on the premises. It is usual with those that have bank barns to utilize a portion of the basement along with a corresponding portion of the mow overhead. Those with barns and stables all above ground may use any portion of the room enclosed, always keeping an eye to convenience, or the silo may be erected altogether outside of the stable, but adjacent thereto. The nearer it can be brought to the central point of feeding the better, and the lower part of the silo should always be on the same plane as the stock.

The size of the silo will depend upon the wants of the stock, actual or prospective, which are to be fed upon the silage. We have found that a cubic foot of silage weighs about 45 lb., which we have demonstrated by actual test. We also find that a mature cattle beast requires about this quantity per day when some other food adjuncts as hay and straw are used. The size of the silo to be constructed may thus be easily determined with approximate correctness from the data given. Silos are sometimes built circular in shape, and this mode of construction has some advantages. More commonly they are built rectangular, but there are some important advantages in having them square, as economy in material of building, economy of labor in filling and emptying, less of outside surface to the silage, and less hindrance to the settling of the same. It is important that the silo should be deep, as the silage settles more compactly, has less waste relatively on the top, holds more because of the greater compression, and is economical of roofing. The disadvantages arise from the greater elevation of the corn into the silo, and the increased difficulty of preventing spreading of the walls. In practice it has been found difficult to get good ensilage in shallow silos without heavy weighting after the silo has been filled.

The materials that have been used include wood, brick and stone, and the lining inside includes such substances as tar paper, coal tar, paint, petroleum, pitch, metal shingles, plaster and cement. All things considered, the wood silo with tar paper between the two linings has given the best satisfaction. It is probable that in the near future silos built of boiler iron and cylindrical in form will be used, and viewed from the standpoint of durability they should prove a success.

The foundation walls should be stone, and the wood sills which rest upon them should be firmly held in place by iron rods and bolts coming up through at least a portion of the foundation walls. The sills may be of the same size as the studding. The size of the studs and their distance apart will depend upon the dimensions of the silo, but more upon the height than upon the width. The size more commonly used is 2x10 inches, and the distance apart should vary from 12 to 16 inches, as the silo is deep or otherwise. The studs should be carefully bridged and should have double tenons at both ends. There should be a girt for receiving the studs every 8, 10 or 12 feet, according to the height of the silo. The plates may be of the same size as the girts.

The sheeting inside may consist of inch lumber jointed, and nailed horizontally on the studding. Where the sheeting covers the girt there should be an air space of one to two inches to prevent decay. This can be provided for when the studding is erected. Inside this lining sheets of tar paper are tacked up and down to assist in excluding the air. Over the paper another thickness of inch boards, tongued and grooved, is nailed horizontally, and so as to break joints. The boards should be planed on the inside to facilitate the settling of the ensilage, and tongued and grooved to exclude the air.

All things considered, lining with such materials as have already been previously mentioned do not seem to avail much in preserving the wood.

When the silo forms a part of the barn or stable there does not seem to be any necessity for sheeting on the outside of the studs.

Where a silo is large it may be necessary to put in one or more partitions, which may be temporary or permanent. If the partitions are permanent there should be a set of doors in each compartment for getting out the silage. Where the walls of the silo are high, advantage may be taken of the presence of the permanent partitions to strengthen them by running iron rods through the partition and within it, from side to side of the silo. The partitions, when permanent, may consist of two tiers of inch boards with tar paper between, or of 2×4 or 2×6 inch scantling placed flat-wise on top of one another and nailed firmly together. When the partitions are not permanent they may consist of two-inch planks kept in position at the ends with cleats.

The corners of the silo should have a board or plank 8 to 10 inches wide, with beveled edges, and the air space behind filled with some substance such as sawdust. The object is to exclude air and to secure the more perfect settling of the silage.

Several kinds of openings are in use in getting the silage out. The farm silo at this station has a succession of doors from the top to the bottom, both at the inside and outside of the studding, the former to spring inward and the latter outward. In filling the silo we fill the space between the doors with sawdust. When the silo is first opened the sawdust is removed, and the space rendered vacant forms a chute for conveying the silage from the top of the silo to the floor of the stable. A cheaper form of opening consists in having as many movable sections of the inner lining between two studs as may be required.

It is greatly important that the floor of the silo be kept dry by means of thorough drainage. Of the different kinds of floors used none have proved more satisfactory, all things considered, than clay, providing the drainage is good. Where there is apprehension of trouble from rats, a cement floor may be made by first using several inches of small stones or rough gravel, with a limited quantity of water lime over them, and above this a light coating of Portland cement.

The cost of the silo will depend upon its size, the materials used, and the cost of the labor. Sometimes it may be to the advantage of the farmer to do most of the work himself. From the data given any one who knows the cost of materials will have no difficulty in arriving at the probable cost of a silo which he may wish to erect.

Feeding Silage. The feeding of the silage may commence at once, but usually the silo is not opened for some weeks after it has been filled. It should be taken from the top of the silo, as feeding by this method is attended with the least waste.

When the silo is opened at the bottom, opportunity is given for a free admission of air, which injures the silage. Where the stable will admit of it, a truck may be used with advantage in conveying it to the stock.

Silage makes an excellent food for milch cows, beefing cattle and store cattle of all ages, when fed with other adjuncts. It has also been found highly useful as a part of the ration in feeding horses not at work; also brood mares and colts of different ages. It has furthermore given good results with breeding ewes, store sheep and lambs that are being fattened, when fed in varying quantities along with other food. Our experience in feeding it to pigs in the different stages of fattening has not been encouraging, but it has a place as a part of a maintenance ration for brood sows. It is not advisable at any time to feed it as the sole ration to any kind of stock. Nor is it prudent to feed it with meal only added for a lengthened period, as by so doing we have found that there is hazard to the life of the animals.

When fed to beef cattle fattening, and to milch cows along with a suitable ration of meal or meal and bran, a limited quantity of hay or straw, cut or uncut, should be fed along with it, and a larger quantity of the latter may be profitably fed along with it to store cattle.

In feeding it is common to put meal on the silage in the feed box. Silage is now considered the cheapest fodder ration which the Ontario farmer can produce.

36. Mixed Grains Grown for Fodder Purposes.

This experiment consisted of 11 plots, which were sown with mixtures of two, three, and four kinds of grain grown together. Each plot was one-hundreth of an acre in size. These grains were sown April 25th. They grew upon soil which had produced grain the previous year, and on which no kind of fertilizer had been used since the spring of 1890.

It will be observed (Table LIX.) that the mixture of peas and oats gave the largest yield of the various mixed fodders grown. The same mixture, with the addition of barley, gave the second best yield, and the same also with barley and spring wheat came third in point of yield. In all cases the following amounts of grain were sown per acre: barley, 66 lb.; peas, 100 lb.; spring wheat, 80 lb.; and oats, 50 lb.

TABLE LIX. Yields of grain crops grown in mixtures for fodder purposes

Crops.	Tons of green crop per acre.
1 Peas and Oats	10.95
2 Barley, Peas and Oats	9.95
3 Barley, Peas, Spring Wheat and Oats	9.85
4 Barley, Spring Wheat and Oats	8.60
5 Barley and Peas	8.50
6 Peas, Spring Wheat and Oats	8.20
7 Peas and Spring Wheat	7.95
8 Spring Wheat and Oats	7.58
9 Barley, Peas and Spring Wheat	7.45
10 Barley and Oats	7.08
11 Spring Wheat and Barley	6.15

37. PEAS AND OATS SOWN IN DIFFERENT QUANTITIES FOR FODDER PURPOSES.

In this experiment nine plots were sown with peas and oats mixed in varying proportions. Each plot was one-hundredth of an acre in size. A grain crop was grown on the land in 1891. No fertilizer was applied since the spring of 1890. These grains were sown April 20th.

TABLE LX. Yields of Peas and Oats sown in different quantities for green fodder.

Quantity of Peas and Oats sown.	Yield of Green Crop per acre.
1. Oats 1½ bush. peas and 1 bush. per acre.	12.10 tons.
2. " 1½ " 2 "	11.85 "
3 " 1 " 1 "	11.80 "
4. " 2 " 3 "	11.75 "
5. " 2 " 1 "	11.55 "
6 " 1½ " 3 "	11.40 "
7. " 1 " 3 "	11.35 "
8. " 2 " 2 "	11.10 "
9. " 1 " 2 "	10.75 "

It will be observed that the best results were obtained from sowing 1½ bush. of oats per acre, and 1 bush. of peas. We require to remember, however, that another season with a different kind of weather, may give different results. But in time we hope to glean with some certainty the quantities which will give the best results in average seasons.

38. RAPE. ITS CULTURE AND USES.

In 1892, 70 plots of rape were grown. Nearly all of these were complete failures, for reasons given below.

We obtained seed of three varieties which were labelled respectively English sowing rape, Broad Leaf Dwarf Essex, and German or Summer rape. They were sown May 25th on plots one-hundredth of an acre in size. The first-named variety proved to be the true Dwarf Essex, which is the kind more commonly grown in this country. But it did not in this case give satisfactory returns, as many of the leaves turned yellow before the rape had attained the usual height. This would indicate that rape early sown is not equally successful with that put in about the end of June. The German or Summer rape began to ripen about the middle of August, and the ripening period extended over a good deal of time. The variety named Broad Leaf Dwarf Essex began to mature seeds about a month later, but it produced but few perfect seeds, notwithstand-

ing the length of time which it continued in bloom. This was the variety so extensively sown in Canada and the United States the past season, owing to the large quantities sent out to Canadian and American seedsmen from England, and labelled "Dwarf Essex." On this farm from 35 to 40 acres were sown to our very great regret, as, in consequence, our arrangements for fattening lambs in the autumn were seriously disturbed, and all the experiments with small plots except those described above were rendered practically useless. These experiments had reference to thick and thin seeding, drills different distances apart, rape on four kinds of soil with and without salt, and plots with various applications of fertilizers. We trust that seedsmen will spare no efforts to prove seed for sale for the next crop, as another mistake similar to that of the past season would be peculiarly detrimental to the rape industry.

It is more than probable that much more attention will be given to the growth of rape in the future than in the past. Practically its growth at the present time is confined to but two or three counties in Ontario. In the other portions of the province it has not be grown at all, so far as we have been able to ascertain, unless in very small test lots since our bulletin appeared on the subject in March, 1891. A very large majority of the farmers seem entirely unacquainted with the habits of the plant, the mode of cultivating it and the uses to which it may be put. It will be in order therefore to again call attention to the value of rape in our system of agriculture, and to the modes of growing it successfully and of using it when grown.

Rape is a plant which bears a close resemblance to the Swede turnip in the early stages of its growth, but it grows higher than the turnip and has a fusiform and stringy root, while that of the turnip is bulbous. On average soils when grown in drills and cultivated, it usually reaches the height of from one to two feet, but on soils very rich in vegetable matter it sometimes attains the height of three feet or more. The variety usually grown in this country is known as the Dwarf Essex. In England and in various countries of central and southern Europe, rape has been extensively grown for the oil obtained from its seeds, but since the introduction of mineral oils the growth of rape seed has been on the decline. In our country of sterner winters, the attempt has not been made to grow it for its seed, nor would it be likely to prove successful though it were tried. In countries where it is grown for the seed, it is usual to pasture it off in the autumn but not too closely, and this may be done without any injury to the crop of seed produced the following summer.

The bulletin issued on this subject in March, 1891, and embodied in the Annual Report of that year, was the first that appeared in reference to rape culture on this continent, and that which our Station issued in 1892 was the second. The first mentioned bulletin gave information gleaned during an experience of two years in growing the plant. The second supplemented the information given in the first by furnishing details of varied experiments conducted in 1891. These details had of necessity to be stated in condensed form. We shall endeavor, therefore, to supplement the information previously given by a more complete and orderly statement of what we have thus far gleaned on the subject.

Adaptability of Climate. Like the turnip, rape is adapted to temperate climates. In all probability it will be found to grow in best form in temperatures that are inclined to be cool rather than warm. It seems to grow more vigorously in our climate in the late rather than the early summer. It continues to grow until time of severe frosts when not matured at an earlier season. But this does not preclude the probability that rape will grow in good form over a large portion of this continent. It would simply imply that a later season would have to be chosen for sowing it in southerly latitudes. Rape should grow in fine form in all the southern portion of the Dominion from the Atlantic to the Pacific. It is scarcely probable that rape will live through the winter in this latitude and yet retain sufficient vigor to produce a good crop of seed, as in Great Britain. Some of the plants appear to live through any winter, but a large proportion of them are either killed outright or are much weakened by the severity of the frost. In more southerly latitudes it may turn out that seed can be grown at a profit.

Adaptability of Soils. The most suitable soils for growing rape are fairly moist free working loams, rich in organic matter. They may be of sandy or clay texture. Black loams are very suitable after the plants once get a start in them, owing to the large amount of humus which they contain. Muck swamps when drained should yield magnificient crops, and with the further advantage to the crops that come after, that the excess of organic matter in such soils will be much reduced by growing rape upon them. All prairie soils should yield good crops of rape. Soils that are suitable for the production of good crops of turnips or corn should also be suitable for growing good crops of the same. It will not grow well on stiff clays, poor sands or on any kind of soil deficient in plant food. The plants are difficult to start in stiff clays and are slow of growth, owing to the difficulty with which the roots penetrate the soil, and the preparation of such soils involves much labor. Light sands and soils deficient in plant food require stimulating, more especially with fertilizers rich in nitrogen. A moderate dressing of farmyard manure in preparing the ground and an average dressing of nitrate of soda after the plants are above ground, will prove helpful.

Place in the Rotation. When rape is grown as a pasture it should come between two crops of grain, as it is an excellent cleaning crop when grown in drills and cultivated. Fields should be selected for growing it which most require cleaning. When thus grown it should always be followed by a grain crop sown to grass, owing to the clean condition in which it leaves the land. As rape luxuriates in soils abounding in vegetable matter, it may be grown with much success on an overturned sod, inverted in the autumn or in the spring, or just after cutting the first crop of clover. We have obtained excellent results after sod overturned in August and sown to rye, cut green and followed by rape. When sown as a catch crop to furnish pasture or green manure, it may follow any cereal or hay crop. Excellent results should also be obtained by growing it after a crop of early potatoes dug and removed as soon as ripe. When grown as a catch crop it may come after any kind of crop that has been removed sufficiently early to give time for the rape to make a good growth.

Preparation of the Soil. The preparation of the soil will to some extent depend upon the rotation. When rape is the only crop grown, and the land does not particularly require cleaning, there would be no special need for any other than spring cultivation. The ground should be carefully plowed as early as possible after it becomes dry, and then worked upon the surface by an occasional harrowing until the time for sowing the rape. When the land requires cleaning it should be gang-plowed as soon as the previous crop has been removed, and then harrowed occasionally to encourage weed germination, and to destroy those seeds which have already germinated. The late plowing in the fall should be deep. In the spring a thorough cultivating early in the season, followed by an occasional harrowing, is all that is required until the land is to be drilled. When a crop of rye is grown, followed immediately by a crop of rape, the method would be somewhat as follows: Plow the ground carefully as soon as the previous crop has been removed, taking care to bury all weeds. Sow rye with the drill at the rate of not less than 2½ bush. per acre, from the 1st to the 15th of September, or even later in case of necessity. The following spring, cut the rye for winter fodder with the binder, and cure in the sheaf, or cut for silage and cure in the silo. In the first instance cut as soon as the rye is well out in head, in the second when in the first blossom. When rye is thus cured for fodder it should be run through the cutting box and fed along with other cut food. For making the rye into silage see page 54 of the Annual Report for 1891. The ground should be carefully plowed as soon as the crop is removed. In fact much of the plowing may be done while the rye is yet in shock. The skimmer should be used on the plow that all weed life may be buried. The ground should then be rolled at once to conserve the moisture, and harrowed weekly until the sowing of the rape. When the rye is to be used as pasture it may be sown as described above, but as soon as possible after the previous crop has been removed. It may then be pastured in the autumn or the following spring until the end of May, and the ground may then be plowed as already described.

When rape is grown as a catch crop the ground should be gang plowed as soon as the previous crop has been removed, and the rape sown broadcast upon the surface after it has been properly pulverized. In very dry weather it would be more prudent to wait for rain than to sow at once. The catch crop may be pastured or plowed in as may be desired the same autumn. But rape may also be grown as a catch crop in drills. When thus grown the ground should be plowed to a fair depth after the removal of the crop. Some cultivation is required while the crop is growing, but not so much as when it has been sown earlier.

To save time, the drilling should be done with the double mould board plow, where such an implement is at hand. It is better to make the drills shallow, than deep, as low drills lose moisture less rapidly. In distance apart, they may be from 20 to 28 inches according as the soil is rich or not. In average soils from 22 to 24 inches between them is considered a suitable distance.

One real difficulty in sowing rape is to get the seed to germinate in the soil, owing to the lack of moisture at seasons when rape is usually sown. It is important, therefore to stir the soil frequently with the harrow or cultivator some time before sowing the rape where this can be done. It may also be necessary in some instances to have the drill follow close after the plow, used in drilling, and in all instances unless the ground should be unduly moist the practice is a good one.

Fertilizers for Rape. Although rape in an average season will give a fair return from ordinary land, it is usually responsive to large applications of farm-yard manure The state in which the manure should be applied will depend on several conditions, relating to soil, season and cultivation. But the late season at which the rape is sown gives ample opportunity to apply it at almost any stage of fermentation that may be desired. Judging by the marked luxuriance produced in the growth of rape on soils enriched with farm-yard manure we would naturally conclude that a complete commercial fertilizer will prove the most satisfactory on average soils. This of course will depend largely upon the requirements of the soil and must be made by the individual by actual test. In our experience the largest increase has been obtained from the application of nitrate of soda and the next largest from the application of salt. No increase was obtained from the use of muriate of potash or of superphosphate. These fertilizers were sown at the rate of 200, 400 and 600 pounds per acre and in no instance would the increase in the crop pay for the fertilizers; but the soil was fairly rich where the tests were made. Relatively the nitrate of soda gave the best returns.

Seed and Sowing. The most suitable time perhaps for sowing rape in Ontario is from June 25th to July 5th, although a fair crop may be obtained when it is sown earlier, and a full crop may sometimes be grown when it is sown as late as the end of July. For catch crops it should be sown as soon as possible after the previous crop has been removed. Fairly good crops may be obtained by sowing it in drills as late as the latter half of August, but the crop thus obtained is less valuable as a food owing to its immaturity at the time of pasturing, and there is also more of hazard to the animals feeding upon it. One of the chief difficulties to be contended with in growing rape arises from the over-dry condition of soil at the time of sowing, especially when it follows a grain crop, the roots of which when growing have pumped much of the moisture out of the land.

The mode of sowing and the amount of seed used will depend upon the object sought.

When the ground does not require cleaning, and also on muck swamps, it may be sown broadcast at the rate of three to five pounds of seed per acre. The less the amount of plant food in the soil the larger the amount of seed that may be used. When sown as a catch crop or for green manure similar amounts will suffice, and the mode of sowing is the same. The ground should be well pulverized and rolled before sowing, and covered with a light harrow followed by the roller to conserve the moisture in the soil. When sown in drills from one to two pounds of seed may be used, according as the ground is fine and moist, or less pulverized and dry. The seed is ordinarily sown with the turnip drill which puts in two rows at a time. The Dwarf Essex variety is the kind more commonly grown, and the seed may be obtained from any of the leading seedsmen at a

cost usually not exceeding ten cents per pound. The seed is hardy and will oftentimes lie without damage in the soil for a long time after it is sown, and when rains come will spring into vigorous life.

Cultivation. When the rough leaf has made a good start in the rape, the cultivator may be introduced. As it is important that the weeds should be destroyed by the cultivator to the greatest possible extent, it should be run as closely to the line of the rows as is consistent with the safety of the plants. The more frequent the cultivation the more rapid will be the growth of the rape. As in the case of corn the cultivation need not be so deep at the last as at an earlier stage, lest the roots be disturbed. Cultivation will of necessity cease after the tops of the rape have met or nearly so, in the line of the rows. When the soil is fairly clean no hand hoeing is required, as the rape is likely to keep in advance of the more offensive forms of weed life. But where it is foul it will be necessary to go along the line of the drill with the hand hoe once or twice to remove weeds. In our experience two such hand hoeings have cost $1.00 per acre. No attention ordinarily is paid to thinning rape, nor do we feel justified as yet in saying that thinning would repay the outlay when not more than two pounds of seed have been used per acre.

Our Experience with Rape. In 1889 we grew 12 acres of rape at this station for pasture. In 1890, 54 acres were grown for the same purpose, and 10 acres more as a catch crop. In 1891, 40 acres were grown for pasture and 6 acres as a catch crop. That grown as a catch crop was also pastured. A large number of plots were also grown each year, in addition to the above, by way of experiment.

The following are the chief of these experiments:

1. Rape grown on four kinds of soil, with and without salt.
2. Rape grown in drills, as against flat cultivation.
3. Rape grown in drills, as against broadcast seeding.
4. Rape grown in drills, at different distances apart.
5. Using different quantities of seed per acre.
6. Thinning the plants to different distances in the drills.
7. Applying different fertilizers to ascertain their respective values.
8. Feeding lambs upon rape grown after fall wheat.
9. Testing the amount of pasturage furnished by a single crop of rape, when grown under favorable conditions.
10. Pasturing lambs upon rape alone, rape with a supplement of oats, and rape with access to a grass pasture.
11. Pasturing swine upon rape alone.
12. Feeding rape as a soiling crop.

The results of these experiments, we hope to give in summarized detail at some future time. In the meantime, we may mention that in our experience flat cultivation in drills gives somewhat larger returns than ridged cultivation; that larger crops can be obtained from rape grown in drills than broadcast; that salt and nitrate of soda are serviceable as fertilizers for rape; that oats do not seem to render much service when fed along with rape that is being pastured by lambs, and that rape and old meadow pasture are superior to rape alone as a pasture for lambs.

The Uses of Rape. Rape is valuable as a pasture, as a catch crop, as a soiling crop, as a green manure, and as a cleaning crop.

1. *Rape as a pasture.* Rape is an excellent pasture for sheep, and lambs, and for cattle that are being fattened. So far as we can judge from our limited experience, it will also furnish good pasture for swine. The value of rape as a pasture arises, not only from its wonderful fattening properties, but because it furnishes pasture at a season of the year when it cannot be obtained in nearly so fine form from any other source. The nutritive ratio of green rape as given by Wolf is 1:2.9, while that of red clover in full blossom is only 1:5.7. But as rape contains more water than clover, the same authority estimates clover as being worth 15 per cent. more than rape, pound for pound, for feeding purposes. On the other hand, we have found that rape will produce from two to three times more in weight from a given area than a single cutting of clover.

In 1889 we pastured 48 lambs on rape, in 1890, 537, and in 1891, 666. A number of these were carried on into the winter, after the season for pasture was over, and were finished for the markets of Canada, Great Britain or the United States. These lambs would have taken the market when brought off the rape, but they were kept on in some instances to obtain higher prices, and in others for purposes of experiment. In every instance they fed well when taken off the rape and put into winter quarters, which tends to prove that pasturing lambs on rape is an excellent preparation for winter fattening.

In our experience of three years in growing rape we find that one acre will pasture, on an average, 10 to 16 lambs from 2 to 2½ months, when the rape has been grown after a crop of rye cut the same season for fodder.

In 1890 the average price paid for 48 lambs, when bought October 9th, was $3.85 per head, and they were sold the following March for the Halifax market at $7.71 per head. They brought 5½ cents per pound, live weight, when sold. In 1890 the average price paid for 537 lambs, when bought in September and early October, including expenses of purchasing and carriage, on the major portion of them, for more than 300 miles, was $3.76. The average price received for 364 head shipped to Buffalo on December 19th, was $5.54. They were sold for 5½ cents per pound. The following May 100 head were sent to England, and they sold there in the Liverpool market at $11.79 per head. A limited number of choice ones were selected and fed on through the summer. Two of these were taken to the Chicago Fat Stock Show, and won first and second prizes respectively in their classes, in continental competition.

In 1891, 666 head were purchased and brought to the farm to be fattened. Of these 362 head were purchased in Prince Edward Island, 1,150 miles from this station, 200 in Lanark and Renfrew counties, and 104 in the Toronto market. These lambs were disposed of between January 8th and May 9th, 1892. 160 head went to the Buffalo market, 209 to Halifax, 99 to England, 149 to Ontario markets, 26 to local butchers, and 23 animals were lost in transit, died or strayed. The average cost, when laid down at the farm, was $3.15 per head, and the selling price was $5.73, which was an advance in price of $2.59 per lamb. The lambs sent to England were estimated at the same price as those of equal quality sent to Halifax, as we refused an offer for them equal to the price paid for the latter.

2. *Rape as a Catch Crop.* The extent to which rape may be grown as a catch crop is only limited by the desires of the farmer, and the peculiarities of the season, as the absence or presence of moisture. When grown for this purpose, it may follow any kind of a grain crop that has been reaped early, and that is not sown to meadow. When sown in drills the ordinary plow must be used. When sown broadcast it will suffice to plow the ground with the gang-plow. In very dry seasons the crop may fail to germinate and so not come to anything, but the only virtual loss will be that of the seed, as the labor will repay itself, because of its helpfulness in destroying weeds. Especially is this true when the ground has been simply gang-plowed. Another plan is to sow some rape broadcast in the grain at some stage of its growth, and to pasture it after the rape has grown up, subsequent to the removal of the crop.

An experiment conducted at this station in 1891, in growing rape as a catch crop, is an indication of what may be accomplished in this direction. The plot covered 2.18 acres. Fifty-one varieties of winter wheat had been grown upon it. Of these 26 were Canadian varieties. They gave an average yield of 53 bush. per acre, and weighed 63.3 pounds per measured bushel. The remaining varieties, which were foreign, gave an average yield of 33.2 bush. per acre, and weighed 59.3 pounds per bushel. We mention these facts to show the extent to which the ground had been drawn upon. The ground was plowed after removing the wheat, and drills were made across the plots and the paths between the rows. The rape was sown in these on August 12th. On October 17th, 60 lambs, bought in Prince Edward Island, were put upon the rape, which sustained them for 25 days without any additional food. The aggregate increase in live weight made in that time was 390 pounds, or 179 pounds per acre. If we value this increase at 5 cents per pound we have $8.95 as the food value of one acre of the rape. This estimate takes no account of the increase in value of the original carcass, or of the manure. The land was also left in a clean and good condition for the crop coming after.

3. *Rape as a Soiling Crop.* Our experience with rape as a soiling crop is somewhat limited, but the results would almost justify the conclusion that rape may be used as a soiling crop with much advantage. Late in October and early in November we cut in all about 1½ acres of rape which had been grown for experimental purposes, and put it in piles about half the size of ordinary haycocks. We commenced at once to feed it to various animals that were housed, but more especially to shorn lambs that were being fed for the English market. Although more than a month elapsed before the piles had all been removed, there were no indications of mould or decay in the rape, and the animals did well that were fed upon it. It may turn out that when thus put up it may be used for soiling purposes even after the snow has fallen to some depth.

We stated in a bulletin issued in March, 1891, that rape is not considered a suitable food for milch cows, as when they feed upon it the milk becomes strongly tainted. We have since ascertained that its suitability for this purpose depends upon the way in which it is fed. If the rape is eaten off as pasture the milk will certainly be tainted, but when cut and given to the cows in moderate quantity, just after they have been milked, no perceptible taint is found in the milk. At least this has been the result where the milk of cows fed in this way has been sent to cheese factories. Rape intended for this purpose may be grown broadcast or in drills, and cut with the scythe from day to day. Unless further tests with rape fed to milch cows should give results of an opposite character it is possible that it may yet come to be used in this way. It will certainly have a beneficial effect upon the milk flow, and also upon the condition of the animals, and it comes into use at a later season than any of the other soiling crops that we grow.

4. *Rape as a Green Manure.* Although our experience with growing rape as a green manure is limited, there is no doubt as to its pre-eminent adaptability for that purpose, especially when grown as a catch crop. The roots permeate the soil and furnish plant food abundantly in their decay. The vegetation which covers the ground at the season of the early fall rains hinders the leaching of nitrates out of the soil. Owing to the ability of rape to withstand frost it continues to grow when vegetation in other forms has ceased. When grown after the harvest season as a green manure, rape should be plowed in the same autumn.

5. *Rape as a Cleaning Crop.* Rape is one of the most valuable crops that can be grown as an aid in cleaning the soil when it is properly managed. There is no crop, perhaps, that will equal it in this respect now grown in this country. This is largely owing to the late season at which the rape is sown, which gives ample time for a long period of preparatory cultivation. It is further owing to the cultivation given the rape when it is grown in drills at a season of the year when many of the hurtful forms of weed life can be destroyed. As a cleaning crop we have found none that will compare with rape in all-round effectiveness. On soils suitable to its growth almost any of the more noxious forms of weed life can be eradicated in a single season with wise management, except in so far as the seeds of the same remain in the ground without germination, and a valuable crop of rape obtained at the same time. Two crops may sometimes be obtained the same season and with the same results, so far as the cleaning of the land is concerned. We have grown rape and rye in conjunction with much success and have reaped good crops of both. Other crops, as meadow and spring grains, may also be followed by rape the same season.

Precautions to be Observed in Pasturing Rape. Pasturing rape has its dangers. Sometimes scouring is induced, more especially when the lambs are first put upon it. Access to salt at all times and to an adjacent pasture have been found helpful as preventives. Tagging should also receive attention before the sheep or lambs are put upon the rape. When first turned in upon a rape field sheep and cattle will too freely partake of it unless the appetite has previously been well satisfied with other food. Bloating may in some instances be induced which, if not relieved, will soon cause death. When sheep are turned in upon it, therefore, they should be allowed continued access to it, unless in time of cold storms, and when removed in no instance should they be put back upon it when hungry. When cattle are pastured upon it they should be kept a portion of the time on a grass pasture, or, what would be preferable on the approach of cold weather, fed in the stables or sheds at night and put on the rape again each morning

after having been fed. On frosty mornings when sheep eat freely of rape, especially of the leaves of plants that are immature, there is some danger that bowel disorders will be induced which may cause death. When the sheep have been removed the previous evening and get a moderate feed of oats in the morning before they return the danger is to some extent lessened. It is at least questionable if there is any profit in pasturing rape after the stalks have been made brittle with hard frost.

When the sheep or lambs have been on the rape for some time they become fat and in consequence are proportionately less active. They sometimes get on their backs in depressed places and are unable to rise, in which condition they will not live many hours. This is the case more especially where rape has been grown in ridged drills. It is a wise precaution, therefore, to visit the flocks at least twice a day, and in doing so the services of a saddle horse will be found very useful where the flock is large.

Great care should be exercised in pasturing sheep and lambs kept for breeding purposes upon rape, more especially when they are of much value, as, for instance, when they are purely bred. The loss of even a limited proportion of animals in such a case would probably overbalance the profits from the rape. In such instances it may be well to allow the animals to remain on the rape but a short time at first. The length of this period may be so increased from day to day that soon they may remain upon it all day. Caution should be exercised as to putting them upon the rape when it is wet with rain or dew, or when it is frozen, and they should never be put upon it when hungry. It may not be known to all that when sheep or lambs are affected with bloating, if they are slaughtered in the early stages of the trouble the meat is considered perfectly good. The same is true of ailments caused by eating frozen rape. By giving prompt attention in such instances nearly the full value of the lambs so affected may be realized. There is less liability to loss from these ailments when the rape is well matured, and these losses seem to vary much with the seasons.

General Observations Regarding Rape. Some authorities advocate hurdling the sheep while feeding on the rape. They argue that when it is fed off in this way the ground will be more evenly manured. While this is true the practice has some disadvantages. The sheep have less of liberty, an important element in their well being, their wool gets more soiled and they are prevented from eating any grass, which is generally believed to be helpful in regulating the health of sheep feeding upon rape. The expense of providing hurdles and the labor of placing them are also to be considered.

It is interesting to note the manner in which the sheep feed upon the rape. When it is grown in drills they walk along the line of the drills much of the time, and so do not injure the rape by tramping. When it grows very rank they do not go far into it, but eat it off nearly to the ground as they go. The waste from pasturing rape with sheep is very little indeed.

Late rape is probably not a very profitable crop. In time of cold rains and sleet the sheep are safer housed. After the rape has been frozen so as to become brittle, when it thaws out again its value as a food is probably lessened, even though the weather should turn warm again, as freezing to the extent indicated seems to leave it in a semi-wilted condition. From our experience in pasturing it at such a time we conclude that it would be more profitable to have the rape eaten off by the time the period of hard freezing arrives.

The increase in weight that may be expected from lambs when feeding on rape alone is probably not less than 10 pounds per month, although much will depend on the kind and condition of the lambs. In our experiments the lowest average gains made per month with a number of lambs were 7.80 pounds, and the highest 12.60 pounds. The former were made by a lot of lambs which were small in size and of the commonest breeding, and when they were pasturing on rape that was immature.

Although rape will not grow well on poor land, the amount of pasture that it will produce under favorable conditions is remarkable. In an experiment conducted here in 1891, the land on which the rape was grown being in good condition, we found that one acre would provide pasture for 36 to 37 lambs for two months, and that it would increase the live weight of the lambs by 762 pounds, which, at 5 cents per pound, would give the food value of the acre of rape as $38.10, without considering the

increase in value of the weight of the lambs when put upon the rape, or the value of the manure. This estimate is based upon an actual test made by pasturing lambs upon a plot containing about one-sixth of an acre.

The time for disposing of the lambs that are pastured on rape is well worthy of consideration. The practice hitherto has been to market them about the time of the closing in of the winter or a little later. The aim in marketing thus early has been to avoid the necessity of providing shelter for the lambs and the labor of feeding them. This practice must now be modified, as owing to the large number of lambs put upon the market at that season, it is likely to be glutted and the prices to be low because of this. As it is not wise to sell live stock at any time in a glutted market, the lambs should sometimes be carried on into the winter months, after the holiday season. As many farmers will probably continue to push their stock upon the market before the holiday season, it is more than likely that lambs will find ready sale and bring good prices during the earlier months of the year, for some time to come. Had we sold our lambs early in December, 1891, we could only have got $4\frac{3}{8}$ cents per pound, live weight for them. On January 1st, 1892, we refused an offer of $5\frac{1}{4}$ cents per pound. The difference between the latter price and the former in the net return for the whole lot would have been $575 or nearly $1 on each lamb. The question of profit and loss, therefore, depends largely upon the time at which the sale is made.

39. Millet. Comparative Test of 11 Varieties.

In 1892, 11 varieties of millet were grown. The plots here also were one-hundredth of an acre in size. The seeding was done on June 11th. Rape had been grown on the ground in 1891. No farm-yard manure had been applied for several years previously. The soil was a mild clay loam. These same varieties were all sown upon test plots in another field on May 25th. The season was very wet at the time. The millets in consequence grew so slowly that they proved a failure, and therefore were not allowed to mature.

Table lxi. Yields from 11 varieties of Millet for one year.

Varieties.	Yield per acre, green crop.
Salzer's Dakota	7.50 tons.
German or Golden	5.93 "
Golden Wonder	5.56 "
African	4.88 "
Pearl	4.61 "
Large African	4.58 "
Siberian	3.61 "
Red French	3.88 "
White French	3.14 "
Broom Corn	2.66 "
Common	2.38 "

It should be mentioned here that a part of the plot on which the Golden Wonder variety was grown was very much impacted through treading the previous year, hence this variety was grown at a disadvantage. The Salzer's Dakota which stands at the head of the list is so far as we know an entirely new variety in this province. The seed was obtained from Lacrosse, Wisconsin. It grows to a good height, stands up well, has an abundance of leaf growth and the heads are strong and of medium length, but it is from 10 to 14 days later in maturing than the common millet. The Golden Wonder Millet is also a new and promising variety. It has long heads and medium length of plant. Three of these varieties grown as a Union co-operative experiment, under more favorable conditions, gave much larger yields relatively than were obtained from any of the plots included in the above table. Further particulars will be given as to these three varieties in the Union report which is also included in this volume.

40. Clover. Comparative Test of 18 Varieties.

In the spring of 1892, 18 varieties of clover were sown on plots which were one-hundredth of an acre in size. The seeding was done on May 9th. The ground was a nine-year old sod which was plowed in 1891 just after the hay crop had been removed. During all these years a crop of hay had been annually taken from the land. No manure had been applied during that period. The land was cultivated on the surface in the autumn, and in the winter well decomposed farmyard manure was applied at the rate of 15 tons to the acre. The plowing which followed in the spring was shallow. The clover all started well except in one or two instances. Interesting results may be expected from these during another year.

In the spring of 1891 seven varieties of clover had been sown, from all of which crops were obtained in 1892. For particulars relating to the sowing of these, see Annual Report for 1891, p. 106. The experiment with all these varieties was conducted in duplicate.

Table lxii. Yields from 7 varieties of Clover sown in 1891.

Varieties.	Yield per acre of green crop.	Yield per acre of hay crop.
Bokhara	30.65 tons.	6.88 tons.
Mammoth Red	13.33 "	2.81 "
Alsike	10.63 "	2.31 "
Welsh	10.58 "	2.25 "
Lucerne	9.23 "	2.77 "
Red	8.05 "	1.89 "
White	6.20 "	1.40 "

The figures in the above table represent the results from the first cutting only of the season. Several of the varieties were cut a second time, but owing to unfavorable weather at the time the results from the second cutting have not been obtained. The value of the experiment in consequence has been much impaired. The Bokhara which stands at the head of the list in point of yield is the same variety commonly known as "sweet clover." It has a tall and branching habit of growth, but early becomes woody. It is not much relished by live stock, but may yet be found useful to grow as a green manure, more especially on light lands deficient in nitrogen. The plot of crimson clover did not survive the winter of 1891-2. We cannot say more as yet in regard to its behavior than that it has done only moderately well.

41. Grasses. Comparative Test of 40 Varieties.

In 1892, 40 different varieties of grass were sown on May 7th. The germination of nearly all the varieties was good, but there were some partial failures. We desire to grow them for purposes of comparison as to absolute and comparative yields, hardihood and duration. We also wish to study their habits of growth more especially in regard to the time or times most suitable for cutting, their behavior in reference to seed production and suitability in every respect for the conditions of our soil and climate. For particulars relating to soil, previous cropping and preparation of soil, see remarks under section 40 which treats of clovers. The rye grasses made the most vigorous growth of all the varieties sown.

42. Sunflowers. Comparative Test of 3 Varieties.

Three varieties of sunflower were sown upon plots one-hundredth of an acre in size. The seed was planted in hills 15 inches apart both ways with one seed in each hill. The planting was done May 5th. They were hoed occasionally.

The seed of the first variety came from Muskoka. Some attention had been given there to growing the crop by the donor of the seed. In northerly latitudes where corn cannot be grown to good advantage, this crop can easily be made to mature. These varieties were cut when the seeds were in the latter stages of the dough condition, were

shocked after the manner of corn, allowed to stand about four weeks and were then run through the cutting box and fed to a milch cow. The results will be reported when giving information relating to the live stock experiments.

TABLE LXIII. Yields of 3 varieties of Sunflower for one year.

Varieties.	Yield per acre.
Hollingworth	25.0 tons.
Russian	21.5 "
Mammoth Russian	20.8 "

43. MISCELLANEOUS CROPS.

Divers crops were grown on a small scale. These are not of sufficient importance to speak of them under separate headings.

FLAX. One small plot of flax was grown. The seed was sown May 25th. It produced at the rate of 10.3 bushels per acre and gave 1.1 tons of straw. The seed weighed 50.5 lb. per measured bushel, which is ½ lb. more than the standard.

BUCKWHEAT. One small plot of buckwheat was grown, the seed of which was sown May 25th. The yield of grain per acre was 3.0.9 bushels and of the straw 1.7 tons The weight per measured bushel was 45.5 lb. or 2½ lb. below the standard weight.

LATHYRUS SYLVESTRIS WAGNERI. A small plot was grown without admixture along with the plots of the clovers and grasses that comparative yields may be obtained in the future. In the spring of 1892 one pound of seed was presented to the station by Francis L. Clotton, Esq., of London, England. It made a very good, growth, but was not sufficiently large to admit of its being cut.

II. LIVE STOCK EXPERIMENTS.

These include experiments with 701 animals, conducted during the year, namely 23 cattle, 666 sheep and 12 hogs. All the food used in the different experiments was accurately weighed and accounted for except that portion of it which the animals gathered when pasturing and which it is impossible to estimate with absolute precision. Bulletins have been issued during the year giving concise statements of some of the experiments. These experiments are given more fully in this report, along with others, the results of which did not appear in bulletin form.

44. FEEDING GRADE STEERS OF DIFFERENT BREEDS.

This experiment is simply the continuation and completion of the feeding test with grade steers of different breeds, the results of which are given for one year in the Annual Report for 1891, p. 125. The animals, as stated in the said Report, were chosen from breeds whose fitness for beef production has been recognized to some extent by at least some sections of the community. The experiment commenced in the autumn of 1889, and closed when the different animals thereof were two years old, with the exception of the native or scrub. When the steers were sold the age of this animal was but twenty-three months, but in the computation it is reckoned as two years old. The reckoning for the last month is based upon the average of the results of the four months previous to the close of the experiment.

A repetition of the facts given in the description of the first year's feeding, and the results growing out of it, will be avoided as much as possible in this narrative, but it is necessary that some things should now be re-stated, to render intelligible the account of the second year's work given here.

The primary objects of the experiment were to ascertain: (1) The average cost of rearing grade steers, for purposes of beef production, from birth until the period of early maturity, when fed upon a heavy or forcing ration. (2) The comparative cost of rearing grade steers on whole and skim milk respectively, and the effects of these on development, after the termination of the milk period of feeding. (3) The comparative cost of producing beef from well-graded and native or scrub animals respectively.

The chief of the secondary objects were to ascertain: (1) The relative cost of rearing animals for beef production during different periods of growth when fed upon a heavy ration. (2) The relative daily gains; and, (3) The total relative increase in weight.

While attempting to secure these objects it was thought that something might be learned at the same time regarding the relative merits of grades of certain breeds for making beef, and the animals used in the experiment were chosen accordingly.

The Animals Selected. The animals secured, eight in number, were obtained from leading breeders, and wherever they could be got of a suitable character. Each individual was the offspring of a pure registered sire, except in the case of the native or scrub, and the aim was in every instance except in that of the native, to have the dam a common grade cow. The effort to secure them as near the birth period as possible was also fairly successful, except in the case of the Galloway grade, which was fifty-three days old when it reached the farm. The Shorthorn grade to which the whole milk was fed, was fourteen days old, and the others were all less than nine days old. The more important particulars regarding these animals are given in the subjoined table. The color, generally speaking, was typical of the breed of the sire.

Table lxiv. Particulars regarding the breeding and the leading characteristics of the different animals.

Grade.	Date when calved.	Sire.	Dam.	Characteristics of steers.
Galloway	Nov. 2nd, 1889.	Rajah of Brooke (3970)	⅛ Shorthorn and ⅞ Canadian.	Short legs and blocky frame.
Shorthorn	Dec. 22nd, 1889.	Methlick Hero=2723= Imp.	A Shorthorn grade.	Rather leggy for Shorthorn type.
Aberdeen Poll	Jan. 1st, 1890.	Runnymede 2nd, 5220.	A common 2-year-old heifer.	Not robustly developed.
Hereford	Jan. 5th, 1890.	King Hal	A good common cow.	Short legs and heavy body.
Devon	Jan. 8th, 1890.	Duke (947)	A Shorthorn grade.	Neatly and squarely built frame.
Holstein	Feb. 17th, 1890.	African Prince (H.F.H.B.) 1270.	A common cow	Large sized and rather coarse in bone.
Shorthorn (fed on skim-milk).	April 1st, 1890.	Macduff	A Shorthorn grade.	Medium sized and neatly built frame.
Scrub or native	April 16th, 1890.	A native bull of the rangey type.	A 3-year-old native.	Narrow bodied, flat ribbed and long legged.

Food and Feeding. The food and feeding until the animals were one year old are given in the Report for 1891, already referred to. During the second year the hay fed was a mixture of timothy and clover, cut. The green fodder consisted of peas and oats and corn when these were in season. The roots comprised turnips and mangels, but these were fed at different periods. The meal consisted of ground peas, ground oats and bran, given in the proportion of 2, 2 and 1. A small amount of oil-cake was given daily for the three summer months of 1891. The meal was fed dry throughout the experiment. The aim was to give the animals a liberal ration, having regard at the same time to their individual capacity to take it. Some of them would not take so much as others, and this accounts for the different amounts consumed, as given in the subjoined table. The food was given in three meals per day. They also had access to water and salt virtually at will.

They were tied in stalls and were allowed exercise daily in the barn-yard. As some fears were entertained at one time that some of them would go off their feet before the completion of the second year, they were allowed to go out to a pasture for three hours daily for ten days, commencing with June 2nd, 1892. During this period they lost in weight from 24 to 40 lb. each, notwithstanding that their usual food ration was given them.

They were sent to the Toronto and Guelph exhibitions, when they were virtually absent from the stables from Sept. 10th to Sept. 24th. The food given during this period was exactly the same in kind as that given them in our stables, except that they did not receive green fodder, and everything given them in the form of food was as usual accurately weighed. They were also at the Guelph Fat Stock Show for two days in the month of December. While the animals were on exhibition some of them made an increase and some of them decreased in weight. The exhibition of the animals told adversely upon the results of the experiment.

Food Eaten. Table LXV gives the consumption of food during the second year of the life of the animals.

Grade.	Food eaten during the second year.			
	Hay.	Meal.	Roots.	Green fodder.
	lb.	lb.	lb.	lb.
Galloway	2,549	3,012	6,537	1,149
Shorthorn	3,309	2,955	6,977	1,096
Aberdeen A. Poll	2,338	2,595	4,788	771
Hereford	2,656	2,737	5,849	824
Devon	3,421	2,436	5,658	1,350
Holstein	3,195	2,880	5,868	1,454
Average (grades of six breeds)	2,911	2,769	5,946	1,107
Shorthorn (fed on skim-milk)	3,429	2,712	5,932	1,182
Scrub or native	2,830	2,528	5,134	1,117

It will be observed that the Shorthorn fed on skim-milk consumed about the same amounts of food as the average grade, except in the item of hay of which he consumed more. The native or Scrub took a little less generally speaking, than the average grade. The individual preferences of the various animals for certain foods is somewhat strikingly shown in the item of roots and green fodder, where the difference in the aggregate of consumption was considerable. The total consumption of the food was large, and more especially with the more concentrated and costly rations, but this was in keeping with the objects of the experiment. It was the intention from the first to use a somewhat forcing ration.

Table LXVI gives a summary and analysis of weights.

Grade.	Individual weight when		Individual increase during second year.	Average individual daily gain.		
	One year old.	Two years old.		First year.	Second year.	Two years.
	lb.	lb.	lb.	lb.	lb.	lb.
Galloway	800	1,345	545	2.19	1.49	1.84
Shorthorn	890	1,385	495	2.44	1.36	1.90
Aberdeen A. Poll	754	1,126	372	2.07	1.02	1.55
Hereford	900	1,245	345	2.47	.95	1.71
Devon	803	1,295	492	2.20	1.35	1.78
Holstein	883	1,303	420	2.42	1.15	1.79
Average (grades of six breeds)	838	1,283	445	2.30	1.22	1.76
Shorthorn (fed on skim-milk)	848	1,285	437	2.32	1.20	1.76
Scrub or native	700	1,215	515	1.92	1.41	1.67

It will be observed that at the end of two years the weight of the Shorthorn fed on skim-milk was practically the same as that of the average grade of the six breeds to which new milk had been fed during the corresponding period. The native or Scrub weighed 68.2 lb. less. The average daily gain of the six grades during the first year was 2.3 lb. while during the second year it was but 1.2 lb. The low average of increase for the second year was doubtless caused by the heavy forcing ration purposely given, and more especially while the calves were yet young. The marked variation in the relative increase in weight made by some of the animals in the first and second years respectively will find at least a partial explanation in the remarks that are given later, when treating of the behaviour of the animals during the contest.

Estimated Value of the Food. The fodder, grain and roots were estimated at the current market values in Guelph, less the cost of marketing from an Ontario farm under average conditions. (See Bulletin lxviii., p. 5.) The home value put upon the hay therefore when cut was $7 per ton; the green fodder $2 per ton; the oats 25 cents per bushel; the peas 48½ cents; and the roots when sliced 6 cents per bushel. The grinding of the grain was put at 6 cents per 100 lb. The bran and oil-cake, reckoned as delivered at the average Ontario farm, were put at $13.40 and $22.66⅔ per ton respectively. It will be observed that in all probability a profit has already been made upon the marketable food used, providing it has been grown upon the farm, as in this experiment the food was charged at the full market values less the cost of marketing from an average Ontario farm.

This profit will be represented by the difference between the cost of growing and the market value put upon it. It is highly important that the probable profit already made upon the food grown should not be overlooked in estimating the financial results from experimental feeding. It may be that in some instances there is no profit, possibly a loss, but generally speaking there is a profit, or growing food stuffs could not be carried on but at a loss, which we know is not generally done. The amount of this profit in some instances would be a reasonable one in itself.

Table lvii. Financial results from the animals until two years old.

Grade.	Cost of						Value of					Gain + or loss −
	Animal at birth.	Food.		Attendance.		Total cost.	Animal.		Manure.		Total value.	
		First year.	Second year.	First year.	Second year.		First year.	Increase second year.	First year.	Second year.		
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Galloway	2 00	27 22	41 34	5 63	6 00	82 19	44 00	29 98	6 00	12 38	92 36	+10 17
Shorthorn	2 00	47 52	43 97	5 63	6 00	105 13	48 95	34 15	6 00	12 38	101 48	− 3 65
Aberdeen A. Poll	2 00	43 02	35 01	5 63	6 00	91 66	39 59	25 16	6 00	12 38	83 13	− 8 53
Hereford	2 00	46 47	38 46	5 63	6 00	98 56	49 50	18 98	6 00	12 38	86 86	−11 70
Devon	2 00	41 62	39 00	5 63	6 00	94 25	44 17	33 53	6 00	12 38	96 08	+ 1 83
Holstein	2 00	48 53	42 16	5 63	6 00	104 32	41 94	23 21	6 00	12 38	83 53	−20 79
Average (grades of six breeds)	2 00	42 40	39 99	5 63	6 00	96 02	44 69	27 50	6 00	12 38	90 57	− 5 45
Shorthorn (fed on skim-milk)	2 00	29 59	41 40	5 63	6 00	84 62	40 28	23 97	6 00	12 38	82 63	− 1 99
Scrub or native	1 00	39 61	39 90	5 63	6 00	92 14	27 13	12 36	6 00	12 38	57 87	−34 27

No conclusions should be drawn from this table without carefully weighing all the facts relating to the experiment during the two years of its continuance.

The value put upon the animals at birth was of necessity an estimate that would be about the real value when they were dropped.

The cost of attendance was reckoned on the basis that one man would feed and care for seventy-five animals per day for the first six months under ordinary conditions when the food has all been made ready, sixty animals for the second six months, and fifty for the second year.

The animals were sold separately for the following prices per pound live weight, viz. : The Galloway grade, 5½c. ; the Shorthorn grade, 6c. ; the Aberdeen Poll, 5¾c. ; the Hereford grade, 5½c. ; the Devon grade, 6c. ; the Holstein grade, 5c. ; the Shorthorn grade fed on skim-milk, 5c., and the native or Scrub, 3¼c. They were also valued at the same time by Mr. John Phin, who did not know of the prices for which they had been sold, and yet the valuation made by Mr. Phin was almost in perfect agreement with these prices. Although we have every confidence in the ability of both Mr. J. Phin and the purchaser, Mr. L. O. Barber, to value the animals at their true worth, where so many interests are involved a larger jury of equally competent valuators would probably have given more complete satisfaction to the general public ; and we are prepared to admit frankly that this is one of the weakest points in the experiment viewed in the light of its defensibility, but there were difficulties at the time in the way of carrying out our desires in this direction. We may add here that the relative valuations given are quite in accord with our own judgment.

The estimated amount of manure made per animal was 21,423 lb. This was reckoned as worth $1.50 per ton. From the sum thus obtained the deduction was made of 4,929 lb. straw used for bedding ; the home value of the straw was put at $1.50 per ton. This estimate as to quantity was based upon actual results obtained from a test conducted simultaneously with another steer, and mainly with the object of ascertaining the amount of manure produced by a cattle beast during different stages of its growth. This mode of estimating the amount of the manure made was also adopted during the first year of the experiment. This steer had been fed very similarly to those in the experiment we are now considering.

Behavior of the Animals During the Contest. The Galloway grade, as was mentioned in the report for 1890, p. 196, was fifty-three days old when it reached the farm. It consumed but a small amount of milk, hence the markedly less cost for food during the milk period. He was a rugged, well-doing animal from the first, eating heartily and making a good use of his food. As he advanced in age he showed a strength of bone and a slight absence of symmetry of development not strictly compatible with the highest excellence of quality. A slight mistake occurred in Bulletin LXX in stating the estimated amount of milk consumed by the Galloway before reaching the Farm. Instead of 2,091½ lb. as given in Bulletin LXX., it should be 1,525.9 lb., as given in the Report of 1890, p. 199. But this error does not affect the summing up of financial results, as these are all correctly given in the said bulletin.

The Shorthorn grade was a good doer from the first. He ate well, made good use of his food and retained his shapes in good form to the last.

The Aberdeen Poll grade was somewhat lacking in individual development from the first. He was always a little under size for his age, but was possessed of fair quality.

The Hereford grade, which developed creditably during the first year, failed to make so good a record during the second. He was occasionally off his feed, which is in keeping with the low increase in weight which he made. He did not, in consequence, so well retain his bloom to the close of the experiment as some of the others, and when sold showed some slight indications of roughness.

The Devon grade was a tidy, smooth, symmetrically developed steer, which on the whole fed well and retained his shapes to the last.

The Holstein grade was a rugged steer from the beginning to the end. He fed well and made relatively fairly good gains.

The Shorthorn grade fed on skim-milk, was never at any time a very smooth or shapely animal. When nineteen months old he was quite unwell for a time. During one month, at the time indicated, he lost forty-two pounds in weight. He showed some lack of thrift from that time onward until he was sold. It was ascertained at the time of slaughtering that he was affected with what may be termed a tumor in the lower part of the abdomen, and in close proximity to the paunch.

The native or Scrub had general good health. He was always hearty, and able and willing to take a fair allowance of food and made fairly good gains, more especially during the second year.

Disposal of the Steers. They were sold at the prices named to L. O. Barber, Guelph, who had them dressed in his own slaughter-house, where they remained open to public inspection for three days prior to their shipment to Halifax.

Notes on the Dressed Carcasses. The following notes were taken while the dressed carcasses were still hanging in the slaughter-house:

Galloway Grade. The carcase of the Galloway grade was strong in shoulder, and it possessed an extraordinary amount of kidney-fat.

Shorthorn Grade. The Shorthorn grade killed well. The fat was well distributed over the whole outer surface of the body, and there was a moderate amount of internal fat. The development of hind quarter was excellent.

Aberdeen Poll Grade. The carcass of this steer was neat and smooth. He had a very large amount of kidney-fat, but was only moderately deep in the loin, and the amount of bone was relatively small.

Hereford Grade. This steer killed more smoothly than he appeared when living. He possessed but a moderate amount of internal fat. He had fair depth of loin and his carcass was pronounced very good for the uses of the butcher.

Devon Grade. The carcass of the Devon grade resembled that of the Shorthorn in external appearance, the fell not being quite so well covered, however, and this holds true of all the others. In depth of loin he was not quite equal to the Shorthorn.

Holstein Grade. The Holstein grade was not so well covered externally. There was an undue amount of fat over the ribs. He possessed a fair depth of loin only. The meat presented on the whole a not unattractive appearance, evidently somewhat light in the hind quarters.

Shorthorn Grade (fed on skim-milk). The carcass in a general way resembled that of the Shorthorn fed on new milk, with the difference that there was considerably less fat externally and internally.

Native or Scrub. He died as he had lived. There was a lack of thickness of carcass throughout, the deficiency in depth of rib and loin being very noticeable, and the absence of what may be termed fleshiness was conspicuous.

Six inches above the knee the shanks measured in circumference, as follows: Galloway grade, 17¾ in.; Shorthorn grade, 17½ in.; Aberdeen Poll grade, 15¾ in.; Hereford grade, 16 in.; Devon grade, 16¼ in.; Holstein grade, 16 in.; Shorthorn grade fed on skim-milk, 15¼ in.; native or Scrub, 15¼ in.

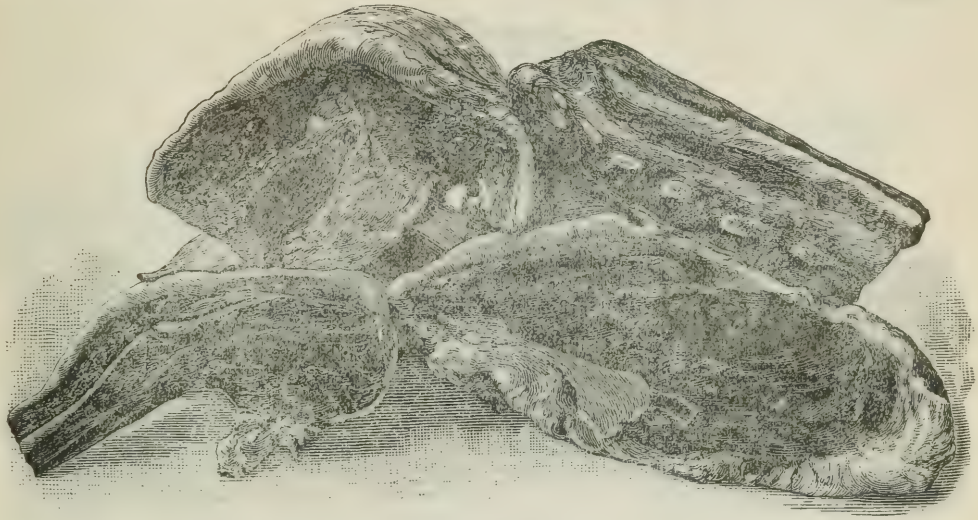
Behavior on the Block. The carcasses of the animals were duly labelled and consigned to Mr. J. A. Leaman & Co., Halifax, by whom they were carefully weighed before being finally disposed of. The relative proportion of the dead weight to the live weight in the different animals is as follows: Galloway, 61.68 per cent.; Shorthorn, 65.42 per cent.; Aberdeen A. Poll, 63.57 per cent.; Hereford, 62.86 per cent.; Devon, 62.68 per cent.; Holstein, 62.59 per cent.; Shorthorn (fed on skim-milk), 62.12 per cent., and the Scrub or native, 57.53 per cent.

Through the kindness of Mr. Leaman we are enabled to give sketches of four of the most valuable cuts of each animal, viz., the sirloin roast, the sirloin steak, the rib roast and the plate.

A careful scrutiny of these sketches brings out many points of difference in reference to the size of the cuts from the respective animals, the amount of kidney-fat possessed by each, the depth of the loin, the relative amount of bone, the relative proportions of fat and lean respectively and the intermingling of these on the opposite.

In the comparison given below wherein the meat of the respective animals of the xperiment is contrasted, that of the Shorthorn is used as the standard, for the reason that

the relative number of the Shorthorn grades reared for meat-making in Ontario in the past has been much greater than of all other grades combined.



SHORTHORN GRADE.

The more prominent characteristics of the cuts of the Shorthorn are shown in their size, in the depth of the flesh, in the moderate amount of the internal fat, the large amount of the external fat on the sirloin roast and the sirloin steak and in the comparative absence of marbling in the flesh, notwithstanding which the whole amount of good edible meat is certainly large.

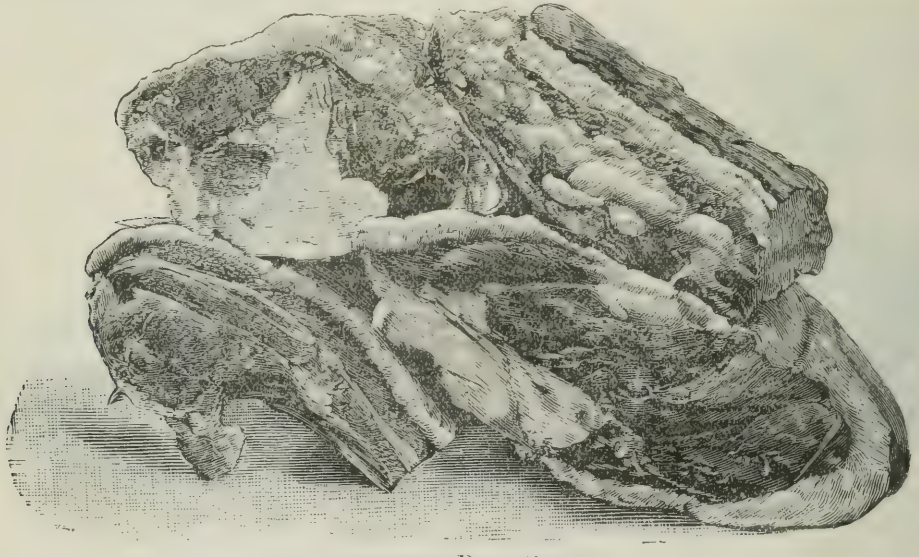
GALLOWAY GRADE.

The more prominent characteristics of the cuts of the Galloway are the large amount of the internal fat, the small size of the plate and the beautiful flecking of the meat. Compared with the Shorthorn there is much more fat on the kidney but less on the externa

portions. There is much less of size and more of leanness in the plate and a more perfect flecking of the meat especially in the rib-roast. The disposition of the fat and lean in the rib-roast of the Galloway is simply perfect.

HEREFORD GRADE.

The most prominent feature of the meat of the Hereford is the large proportion of the fat to the lean, both internal and external, and the excess of the fat in the plate. Compared with the Shorthorn the Hereford has more of fat relatively, especially in the sirloin roast, and plate cuts, the plate is not so deep and the veins of fat are more pronounced in the Hereford, more especially in the rib-roast.



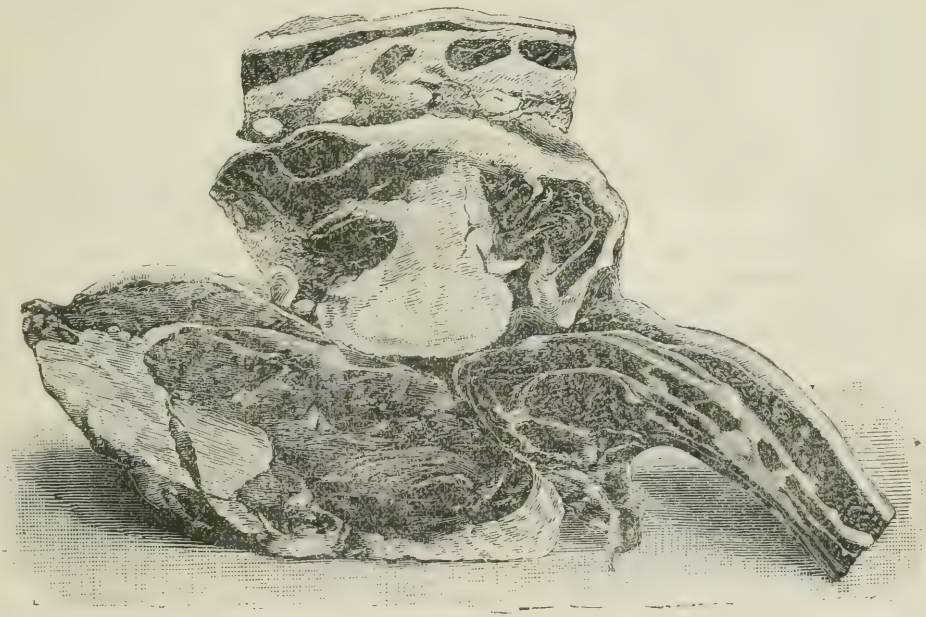
ABERDEEN POLL GRADE.

The chief of the features of the meat of the Aberdeen Poll are found in the depth and fatness of the plate and in the marbling and flecking of the meat. Compared with the Shorthorn the size of the sirloin roast is less as is also the quantity of lean meat in it,

and the rib roast is not so deep, but the flecking of the meat, especially in the sirloin, as in that of the Galloway, is more perfect. A slice from either of these would doubtless be tender and juicy.

DEVON GRADE.

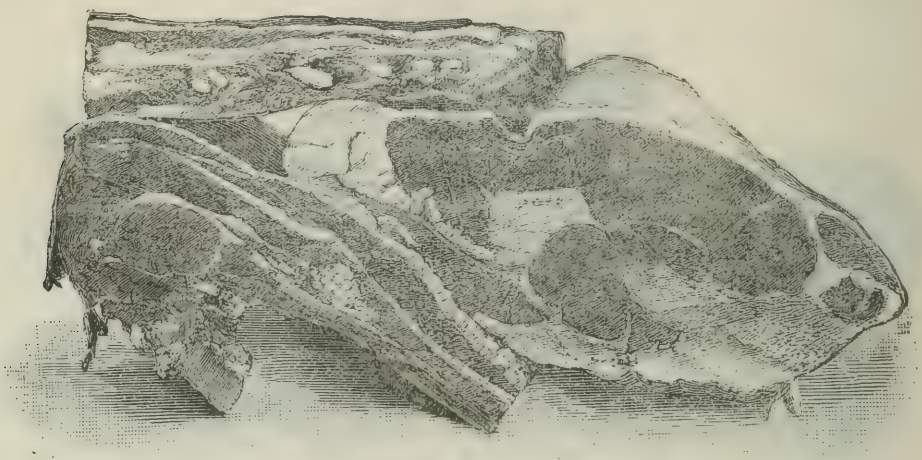
The principal characteristics of the meat of the Devon are found in the marbling of the same and in the large amount of the external fat on the sirloin steak and sirloin roast. Compared with the Shorthorn there is more of external fat on the larger cuts of the Devon, much less of size in the plate and more of marbling in the flesh. The rib-roast in the Devon is particularly good.



HOLSTEIN GRADE.

The more prominent features of the meat of the Holstein are found in the large amount of solid kidney-fat, the large proportion of the fat in the plate and in the nicely mixed character of the meat, more especially in the rib-roast. Compared with the Short-

horn there is less of depth of meat in all the cuts, more of solid fat in proportion to the lean, and withal more of what may be termed veining, especially in the rib-roast.



Native or Scrub.

The chief characteristics of the meat of the native or Scrub are found in lack of depth in all the parts. It is unfortunate that the sirloin roast cut is not shown in this instance, as the amount of kidney-fat was decidedly deficient. Contrasted with the Shorthorn there is much more of thinness of meat, that is to say, lack of covering of the bony parts and lack of depth of flesh. The covering of external fat is also much less, but the blending of the fat and lean cannot be objected to.

The following are some of the more important conclusions to be drawn from the second year's feeding:

1. The great importance of quality in animals that are reared for making beef. The price received for those in the experiment varied from 6 cts. per pound live weight to 3¼ cts.

2. That in rearing beef-animals when they are fed a forcing ration during the first year, the results of the second year's feeding will not be satisfactory either as regards the general well-doing of the animals or financially.

3. That there is a marked difference in the constitutional ability of animals to bear a forcing ration, as witnessed in the behavior of the Galloway grade for instance, which made the highest daily gains during the second year of feeding.

4. That in rearing animals for beef when fed a forcing ration for two years as in this experiment the meat will be made at a loss. In this experiment the extent of the loss was $68.96 on the eight animals with the value of the manure included.

5. That the expense of rearing the native or Scrub, including outlay and income, was more than that of rearing the average grade by $28.82, and more than that of the Shorthorn fed on skim-milk by $32.28, while the total loss on the native or Scrub for the two years was $34.27.

6. That stall-fed animals though allowed daily exercise in a barn-yard will lose weight for a time when turned out on a grass pasture, and that travelling by rail though but for a short distance followed by change of surroundings for but a short time will seriously interfere with the gains of the animals.

General Observations.

Some of the objects of this experiment have been attained. Some light has been thrown upon the average cost of rearing grade steers for purposes of beef production from birth until early maturity when fed upon a heavy or forcing ration. We have found, as was anticipated, that feeding such a ration has given results that are not satisfactory. Then why, it may be asked, was the experiment undertaken? In answering this question we ask the reader to bear in mind that this is but the first of a series of experiments all bearing upon beef-making. All shades of opinion prevail in reference to the rapidity with which beef should be made. Some argue that the animals should be forced along from the first as quickly as they will take food. Some favor liberal feeding without forcing until the finishing period arrives. And yet others favor what may be termed an economical ration—feeding the animals but moderately and keeping them on what may be termed cheap rations until the finishing period. It is important, therefore, that all the light that may be available should be thrown upon these questions. This experiment has shown the easy possibility of feeding a ration too stimulating and too costly to get satisfactory results. But some allowance should be made in all feeding that is done at experiment stations for the hindrance to progress brought about through frequent disturbances necessitated by the presence of a visiting public. Because of this influence the best possible results can never be attained at these stations, so long as the animals are thus exposed to the disturbing influences mentioned.

In the next experiment the economical ration will probably be adopted, which will give excellent opportunity for comparing the merits of the two methods.

The second object of the experiment, viz., the comparative cost of rearing grade steers on whole and skim-milk respectively, and the effects of these on development after the termination of the milk period of feeding have been but imperfectly realized, owing to the temporary indisposition of the steer which had been fed upon the skim-milk ration toward the close of the test. This effectually bars the way to comparison during the second year of the experiment. Some important lessons are gleaned, however, from the first year's feeding, as pointed out in Bulletin LXX, p. 8, wherein it is shown that while the average cost of a whole milk ration with adjuncts for the first six months was $24.40 per animal, the cost of feeding the Shorthorn grade on skim-milk with similar adjuncts was but $9.06, and that although in the comparison then drawn there is a difference of $15.34 in the cost of the food, the difference in the value of the animals at the close of that period was but $5.15. It is also shown on page 9 of the same bulletin, that the animal fed on skim-milk cost $12.81 less than the average grade fed on new milk, whereas his value at that time was but $4.41 less.

Some information has been gleaned which should prove really valuable in reference to the third object of the experiment, viz., the comparative cost of producing beef from well-graded and native or Scrub animals respectively, whereas in the two years of the experiment the cost of the Scrub was $3.88 less than that of the average grade, his value at the end of that time was less by $32.70. The advantage therefore in favor of the average grade as compared with the Scrub is represented by $28.82. But it should be carefully noted that the difference, large as it is, chiefly arises from a difference in quality.

We have also gained valuable information in regard to secondary objects of the bulletin, more especially in regard to the relative cost of rearing animals for beef production during different periods of growth when fed upon a heavy ration, and also in regard to the relative daily gains. At the end of the first year the average grade of the six breeds showed a profit of 66c., while at the end of a second year he shewed a loss of $5.45. During the first year the average grade shewed a gain of 2.32 lb. per day, while during the second year it was but 1.22 lb. per day. These results confirm the opinion that so far as the individual animal is concerned the relative weights and also the relative profits decrease as we recede from the birth period when a forcing ration is used.

The whole question is one of much importance as well as of great interest. The field for investigation along the lines entered upon is practically without limit. It is our

intention to pursue it indefinitely in the hope of gleaning information that will be of much practical utility to the farmer, and in the pursuit of these investigations we shall give much prominence to the question of the economical production of beef.

45. Corn Ensilage for Making Beef.

This experiment began December 16th, 1891, and closed on May 13th, thus covering a period of 150 days. It is the third of a series of experiments conducted at this station with the same objects in view.

The chief of the objects of the experiment were (1) to ascertain the relative value of the following rations for making beef, viz., ensilage and meal; ensilage, hay and meal, and roots, hay and meal, and (2) to ascertain the cost of making beef when the values of food and meat are both considered. The animals selected were fairly good grade steers in which there was a predominance of Shorthorn blood. They were purchased by Mr. J. E. Storey, the farm foreman and brought to the farm July 25th. They were then put on grass pasture and so kept until October 12th, at which date they were put in the stables. During this period, viz., while they were on pastures the average gain per day on the whole lot was 1½ pounds.

Period of Preparation. On November 29th six uniform animals were chosen and divided into three groups, with two animals in each group. They were placed in double stalls, one group in each stall. They were fed for 16 days previous to the commencement of the experiment, on the same rations as were given them during its continuance. The object was to accustom them to the new diet.

Food and Feeding. The animals in group 1 were fed all the ensilage they would eat clean. The aim was to give them 10 pounds of meal per day per animal. Those in group 2 were given 30 lb. ensilage per day, the same amount of meal as the animals in group 1, and all the cut hay they would consume. Those in group 3 were given 45 lb. sliced roots per day, the same amount of meal as was given to each of the other groups, and all the cut hay they would consume. The hay was principally timothy, and the roots were turnips and mangels. The meal consisted of equal parts by weight of peas, oats and barley. The foods fed to the respective groups were mixed just before being fed, and were given in three feeds per day. They had salt and water at will.

Food Eaten. One of the animals in group 1 died on January 25th, forty days after the commencement of the experiment. He was observed off his feed on January 23rd, and died two days later. J. Hugo Reid, V.S., of Guelph, was called in the absence of Dr. Grenside. He at once gave it as his opinion that the steer would not recover, and furthermore that the ensilage fed was concerned in his illness. A post mortem examination was made by Dr. Reid the same day on which the steer died, and the next day, Jan. 26th, he forwarded the following report: "By post mortem held by me on steer that died on the farm yesterday, I wish to state that I found a rupture in the fourth or true digestive stomach, with an escape of a portion of the contents. There was inflammation of the peritoneum and slight inflammation of the small intestines. The rupture of the stomach was caused by gases formed from the food in the stomach, and such food when fed in large quantity appears to be of an indigestible nature. Death was no doubt caused by said rupture." One of the animals also in group 2 occasionally refused food. For 20 days in succession in the month of March he would not eat ensilage, and his gains in consequence were unsatisfactory. Because of these experiences we decided that it would be more satisfactory to use but one animal in each group for purposes of comparison. As we have thus far in this series of experiments used the term group, we shall continue to use it as a matter of convenience, although the reference in future will be but to one animal.

The following amounts of food were consumed daily by each animal:

	Ensilage. lb.	Roots. lb.	Hay. lb.	Meal. lb.
Group 1	53.50	....	....	9.64
Group 2	28.39	....	7.22	9.55
Group 3	....	41.43	10.39	9.67

Weights of the Animals. Fasted weights were used both at the commencement and the close of the experiment. The fast consisted in withholding food from 6 p.m., after the evening meal had been given, until the animals had been weighed the following morning. Natural weights were taken frequently throughout the experiment for the reason, among others, that in case of mishap we would have the necessary data for calculations. It may be mentioned here that the average shrinkage in weight from fasting was 42⅔ lb. at the commencement of the experiment and 31 lb. at its close.

Table lxviii. Analysis of weights of the animal in each group.

	Group 1.	Group 2.	Group 3.
	lb.	lb.	lb.
Weight at commencement	1298	1399	1364
Weight at close	1581	1601	1607
Increase per animal	283	202	243
Average daily increase per animal	1.89	1.35	1.62

For the animal in No. 1 group made the largest gains, notwithstanding that he was off his feed on two or three different occasions for a short season. That in No. 2 group was also off his feed occasionally, but only for a brief interval at one time. The steer in No. 3 group had uniformly good health all the time.

The Estimated Value of the Food. The meal, the roots and the hay were estimated at the current market values in Guelph, less the cost of marketing from an Ontario farm under average conditions. The home value put upon the oats therefore was 26 cents per bush., peas 50 cents, barley 40 cents, roots (sliced) 6 cents per bush., and hay when cut $9 per ton. Corn ensilage was valued at $1.75 as in the corresponding experiment of last year. The grinding of the grain was put at 6 cents per 100 lb. The cost of the daily ration given was: To the animal in group 1, 13.07 cents; in group 2, 14.04 cents and in group 3, 17.24 cents.

The ensilage ration, therefore, was the cheapest of the three. If that were the only consideration we have no hesitancy in recommending it before either of the others, but various weighty considerations claim our attention, such as its effects upon the life of the animals. On the other hand, if the cost only were to be considered we would pronounce against the root ration; but it has important advantages which must not be ignored. Further reference will be made to these points.

Table lxix. Financial result of the experiment.

	Group 1.	Group 2.	Group 3.
	$ c.	$ c.	$ c.
Cost of animals at commencement of test	51 92	55 96	54 56
Cost of food	19 60	21 06	25 86
Cost of attendance	3 13	3 13	3 13
Total cost	74 65	80 15	83 55
Value of animals at close of test	92 88	94 06	94 41
Value of manure	6 75	6 75	6 75
Total value	99 63	100 81	101 16
Gain per animal	24 98	20 66	17 61

VALUES. At the commencement of the experiment the animals were valued at 4 cents per pound live weight, which was the average market price paid for steers of this class at the time. They were sold for $5\frac{7}{8}$ cents per pound on May 18th, 1892, two days after the experiment closed. The cost of attendance was computed on the assumption that one person, at $25 per month, would feed and care for 40 head under ordinary conditions. This was the estimate used in the corresponding experiment of the previous year. At the close of the experiment the animals were sold to go to Britain at $5\frac{7}{8}$ cents per pound, fasted live weight.

The manure was estimated at $1.50 per ton, as in the corresponding experiment of the previous years, and the value of the bedding was deducted therefrom in the same way as in the experiment referred to.

The total net cash gain on the 3 animals used in the experiment was $43, equal to a cash gain of 18.04 per cent. on the investment. The total gain on the five animals was $54.75, equal to a cash gain of 13.07 per cent. on the investment. The total loss on the six animals of the experiment, including the dead one, was $7.09. This estimate includes the food eaten by the animal that died, and all other outlay for the six animals, and for the food consumed by them, but it does not include the cost of attendance or the value of manure.

When the manure is included the total gain on the three animals of the experiment was $63.25, on the five animals sold at its close $88.50, and on the six animals $27.32.

The amount received for the three animals of the experiment when sold on May 18th, was $281.35, which was within 65 cents of being twice the sum paid for them on July 25th, 1891, when they reached the farm.

CONCLUSIONS FROM THE EXPERIMENT.

1. That the total cash gain on the investment when the three animals are taken into the account, without including the manure, and the cost of attendance, was $43, and the average gain on each animal $14.33. When these items are included the total gain is $63.25, or an average of $21.08 on each animal.

2. That in this experiment the cost of food in making 100 lb. of increase in live weight from the ration of ensilage and meal was $6.93, from that of ensilage, hay and meal, $10.43, and from the ration of roots, hay and meal $10.64.

3. That in this experiment an average individual daily gain was made of 1.62 lb., at an average cost of 14.78 cents for the food used.

4. That there is some hazard in feeding a full ration of ensilage to animals that are being fattened when it is fed in conjunction with meal only.

5. That in this experiment the value of the animals for beef purposes was increased by the fattening process an average of $1\frac{7}{8}$ cents per pound live weight.

6. That while the shrinkage in weight from a 12 hours' fast in the stable was $42\frac{2}{3}$ lb. per animal at the commencement of the experiment, it was but 31 lb. at its close.

CONCLUSIONS FROM THE THREE CORRESPONDING EXPERIMENTS CONDUCTED IN 1890, 1891 AND 1892.

These conclusions give the results from three experiments for three consecutive years, and from five animals with the three different rations used.

1. That the daily average cost of each ration was as follows:

Ensilage, hay and meal	16.78 cts.
Ensilage and meal	16.90 "
Roots, hay and meal	19.10 "

2. That the average daily increase of live weight from each ration per animal was as follows:

Ensilage and meal	1.88 lb.
Roots, hay and meal	1.74 "
Ensilage, hay and meal	1.63 "

3. That the average selling price of each animal fed on the different rations with the cost of food added, exceeded the buying price as stated below :

Ensilage and meal	$12 65
Ensilage, hay and meal	10 95
Roots, hay and meal	8 22

4. That from the behavior of the animals fed ensilage and meal we do not consider this ration a perfectly safe one for finishing live stock in beef making, as, out of the six animals fed upon it, two died and three were occasionally off their feed.

5. That from the behavior of the animals fed ensilage, hay and meal, we conclude that these food factors form a much safer ration than one composed of ensilage and meal only, although the animals fed upon it gave some trouble by occasionally refusing to take their food.

6. That from the behavior of the animals fed roots, hay and meal, we conclude that this ration is a very safe one to use in finishing live stock for beef making, as the six animals fed upon it had uniformly good health all the time.

7. That steers 1,200 lb. and upwards shrink in the neighborhood of 40 lb. with a fast of 12 hours while standing in the stable during the finishing period ; that the shrinkage decreases somewhat as the fattening period progresses ; that it is considerably greater while they are at liberty in a yard while being fasted, and when thus fasted the shrinkage will be less when the animals are given exercise occasionally.

Note. The sources of the information from which these conclusions are drawn are Bulletin XLIX, the Annual Report for 1891, p. 106, and the experiment narrated above.

General Observations.

1. It will be apparent to the thoughtful reader of the reports issued on these experiments in beef-making for the past three years, that the principal object of the same has not been realized as yet. This leading object was "to ascertain the relative value of ensilage and meal ; ensilage, hay and meal ; and roots, hay and meal in beef-making." While they have shown that the ensilage and meal have produced the highest daily gains, and that they furnish a cheap ration relatively, they have also demonstrated that there is an element of danger in feeding them which in the end may make them too costly for beef-making. They certainly formed the dearest ration of the three if we take into account the animals which died through feeding it, and that is, of course, the proper way of reckoning. Unless we can adopt some mode of feeding it which will completely eliminate the element of danger, we cannot regard this ration as being either safe or profitable to use alone in beef-making.

While the ensilage, hay and meal furnished a cheap ration, and on the whole a safe one, it cannot be said that our experience with that ration has been completely satisfactory. Those occasional spells of temporary indisposition which some of the animals manifested, though of brief duration, are calculated to give some anxiety to the careful feeder. The explanation that heavy feeding may have been the exciting cause is not a sufficient one, for the animals to which the roots and hay were fed were getting identically the same meal ration as those getting the ensilage and hay, and yet the former maintained uniformly good health throughout the three experiments.

The excellent health maintained by the animals which were given the ration of roots, hay and meal is so far satisfactory, but this satisfaction is considerably lessened when we reflect that the five animals fed this ration come third in point of daily gains, and in reference to profit we cannot give them higher than a second place.

2. Some progress has been made in reference to the solution of the second object of these experiments, viz.: to ascertain the cost of making beef when the values of food and meat are both considered. These experiments have demonstrated that beef can still be made at a cash profit in Ontario when good grade animals about two years old are carefully purchased and judiciously fed, for in these experiments we have still a net cash profit of $37.03, throwing the two dead animals into the compost heap. This profit does not include the items of attendance, bedding and manure.

But these experiments have not succeeded in making meat at a profit on the actual increase in weight, that is to say, the increase in live weight alone will not in any case at the prices which it brought when sold pay for the food used in making it. The profits relatively were greater on the animals carried through experiments Nos. 2 and 3 than they were with those of No. 1. Notwithstanding, with those of No. 2 experiment 100 pounds of increase in live weight, required a cost of $8.86 for the food, and with those of No. 3 experiment a cost of $9.33, while the price realized in both cases was but $5.87½ per 100 lb. The profit was found in the increase in the value per pound of the live weight of the animals when they entered the experiment. Whether this feat can ever be accomplished during the finishing season under ordinary conditions is a question which the future alone can reveal.

This question also raises another, the solution of which is all-important in growing beef, viz: do the growers of store animals get compensation for their labor and the food used when they raise animals up to the age of two years or thereabouts, and then sell them for four cents per pound live weight, which was about the price paid for the animals used in these experiments. There is great room for valuable investigation in solving this problem.

Although these experiments have not accomplished all that we could wish, they have made two things very apparent, and both are important. First, they have made it pretty clear that ensilage and meal alone do not furnish a ration that is altogether safe for finishing beef cattle. We not only lost outright two animals out of six fed upon it, but three of the remaining four had periods of greater or shorter duration, when they were so indisposed that it was necessary to change the ration for a time to restore the equilibrium. It may be hinted that ensilage has varying degrees of sweetness, hence it may be possible to make ensilage that will not be attended with danger when thus fed. While this may be true, is the average farmer, we ask, competent to make it under all circumstances, or even in a majority of instances, so that all danger will be eliminated? And second, they have proved in a comparative sense the great safety in feeding a ration of which roots is an important factor. In a country so well adapted for growing roots as Ontario we feel like calling out "not so fast" to those who are advising the farmers to substitute corn for roots. We rather advise in the meantime, continue to grow roots and grow corn also.

Since these experiments have not accomplished all that we have been seeking, we think it would be a great mistake to bring them to a close at the present stage. Valuable facts remain yet undiscovered. It is clearly our duty to seek them further. From what we have done we feel like saying there is an element of great excellence in corn ensilage as a food factor in making beef. But we do not seem to have discovered the very best way of feeding it. Has anyone else? We shall therefore go on with some modifications. We want to learn how much fodder, as hay or straw, or hay and straw, must be added to render the finishing ration a perfectly safe one, and with this and kindred objects in view we shall continue these investigations.

46. Feeding Rape to Cows for Milk Production.

Much has been done at this Station in the past few years to test the real value of rape as a food for fattening sheep, but not until this season has this plant been used as a food for milch cows. There are those who claim that rape would be unsuitable for milk production owing to the taint which would likely be in the milk from the rape if fed to cows. To glean information upon this and other points in regard to the use of rape, an experiment was commenced on October 20th, 1892. Four cows were chosen and divided into two groups. The test, which lasted 53 days, was divided into four periods. During the second and fourth rape was given, and during the first and third no rape was fed. The cows each received 5 lb. of meal per day throughout the experiment. This along with pasture, formed the ration of the first period, and the meal along with hay and ensilage formed the ration of the third period. Group I was allowed 40 lb. of green rape per day and all the hay they would eat, and group II received all the rape they would

take but got no hay in addition. The average daily amount of rape eaten by each animal in group II was 75.7 pounds. The following was the average daily amount of milk obtained from each animal in each group:

		milk.
Group I.	Ration with rape	19.13 lb.
"	" without rape	17.25 "
Group II.	" with rape	18.20 "
"	" without rape	17.74 "

From this it will be observed that the heaviest yield of milk was obtained from rape and hay, and the second heaviest from rape without hay. The lowest yields in both groups were when no rape was given.

The rape was fed both before and after milking, and the milk after being tested in several families was reported to be perfectly good with no perceptible taint of any kind. Mr. Rogers, the assistant in the dairy department, kindly tested the milk with the Babcock tester and found a slightly larger percentage of butter-fat in the milk from the rape ration than from the ration in which rape did not form a part. These facts point to the importance of a further study of rape as a food for milch cows.

47. Feeding Calves on Skim-milk, Skim-milk and Linseed Meal, and Whole Milk.

In this experiment which is still under way, six Shorthorn grade calves are being fed They were selected in the spring of 1892, and were divided into three groups of two each. They were all fed a free and full supply of milk until they were five months old. Those in the first group were fed skim-milk without linseed meal. In the second group they were given skim-milk and linseed meal, and in the third group whole milk. Other adjuncts as hay, meal, etc., were given them as soon as they would take it, and they were all given the same adjuncts in kind. These adjuncts were continued after the milk period in such a way as to promote quick development, and it is the intention to finish them at about one year old. They will be fed heavily during the finishing months. The chief of the objects of the experiment are to ascertain the comparative cost of the rations used, and also their relative suitability, with the further object of determining the most economical rations in rearing young animals for meat-making.

48. Determining the Amount of Manure Made by a Cattle Beast.

This experiment has been going on for more than two years. It is the intention to carry it on until the animal is at least three years old. It is one of rare interest, and should prove of much value when completed, and more especially when confirmed by repeated experiment. We will then be able to use data which will be very near the truth as a basis for calculations relating to farm-yard manure. In the past these have been estimates made oftentimes with but little precision. On December 23rd, 1892, Prof. Shuttleworth handed to us the statement of the results of the analysis of the manure taken from the stall a short time previously. This analysis represents the average of several determinations which were in substantial agreement. The analysis is as follows

	per cent.
Water	53.51
Nitrogen	.634
Phos. acid	.829
Potash (K_2O)	1.494

These results speak of high quality in the manure, but this is what we should look for from a grain-fed beast, kept in a box-stall. The experiment and also the lessons to be learned from it will be given in detail when it is completed.

49. Determining the Relative Value of Six Varieties of Clover Hay and Three Varieties of Sunflower for Milk Production.

Six varieties of clover hay were fed to a milch cow to learn something of the relative value of each in milk production. Three varieties of sunflower were grown and used for the same purpose. While the results are interesting it is considered unsafe to present them to the public until repeated tests have been made. The sunflowers were eaten readily, but when fed in large quantities caused the cow to purge. The milk from the cow when fed sunflowers was of good flavor and possessed good keeping qualities.

50. Determining the Effects of Constant Confinement Upon the Breeding Properties of a Cattle Beast.

To show the effects of constant confinement upon the breeding properties of a cattle beast an experiment was commenced in 1890 and closed in 1892. An Ayrshire grade heifer calf was chosen for the test. From the time she was born on May 20th, 1890, until December 20th, 1891, she was not allowed out of her stall except during the second summer when she became crippled in the limbs and was allowed exercise for a short time daily for about two weeks. On September 23rd, 1891, she was served by the Ayrshire bull, on October 12th again by the same bull. On October 31st she was served by the Holstein bull, and again on December 6th by the same bull, but these bulls were unable to get her in calf. On December 23rd the heifer was in season again but was not served. On December 24th she was turned out for exercise and this was kept up regularly. On January 9th, 1892, she was again served by the Holstein bull, and on January 27th by the same bull again. The last service was effectual and she gave birth to a calf on November 6th, 1892. This goes to show that constant confinement is apt to effect very materially the breeding properties of a cattle beast.

51. Fattening Lambs.

During the past three years we have been giving considerable attention to the subject of fattening lambs, as has been indicated in the respective Annual Reports issued in those years. We are still experimenting somewhat largely in the hope of gaining further knowledge in reference to this very important but hitherto very much neglected industry, as will be shown in the proper place In the autumn of 1891, 666 lambs were purchased and brought to the Station with a view to fatten them on food nearly all of which had been grown on the farm. In the statement of the Farm foreman, given on page 139 of the Annual Report for 1891, the number of lambs is given as 676, but in this statement 10 lambs are included which of necessity were bought when securing a car-load. They were so light that they were considered unfit for shipment They were therefore sold on the Island for what they would bring and the money received for them accounted for separately, without in any way mixing up the transaction with that relating to the 666 lambs actually brought to the Station.

The particulars relating to the purchase of these lambs are given in summary below :

Date of purchase.	Where bought.	Cost when laid down at the Station.
August 29	200 lambs in eastern Ontario	$669 10
September 14	200 lambs in Prince Edward Island	552 61
October 7	162 lambs in Prince Edward Island	483 98
" 20	104 lambs in Toronto	391 65
	Total	$2,097 34

The cost of the purchase and transit of the 362 lambs from Prince Edward Island to Guelph averaged $0.95 per head, or 49⅓ per cent. of the purchase price of the lambs, the distance between the two places being from 1,100 to 1,200 miles. The average purchase

price of each lamb was $1.92. The chief of the reasons which led us to purchase the lambs so far away from the Station include the following :

1. To encourage the system of finishing lambs in all parts of the Dominion in finer form than is usually done. In nearly all the provinces, and more so in the outlying provinces of the Dominion, lambs are put upon the market in the late summer or the early autumn months with no other finish than that furnished them by pastures which oftentimes are ill-adapted to the purpose at the seasons mentioned.

2. To demonstrate that such lambs as we have at present can be so handled that they will bring us a much better price than is ordinarily received for them. When lambs are put upon the market in a half-finished condition, the seller is, in a sense, at the mercy of the buyer, as the competition for a marketable article for daily consumption is usually in proportion to its excellence. When nearly all farmers are selling ill-finished lambs at the same season the price paid cannot be otherwise than discouragingly low. But we would have it distinctly understood at the same time that while we seek further improvement in the mode of handling such lambs as we have, we are convinced that every reasonable effort should be made to improve the breeding of our lambs, which in very many sections is deplorably low.

3. To demonstrate the helpfulness of rape as an aid in fattening lambs whether they are to be sold at the close of the pasturing season or carried on into the winter months and sold in even completer form and at higher prices. The growing of rape in Ontario even is as yet understood by but few farmers, while in the other provinces it is scarcely practiced to any extent. It is only fair to them that this station should endeavor to prove helpful to those provinces which send so large a number of students relatively to our College.

Character of the Lambs. The lambs purchased in eastern Ontario were a fairly good lot, though small. As will be seen by reference to the weights given below, they were considerably under the average of lambs of the central and western parts of Ontario which at the season indicated would probably average 80 to 85 pounds. They were of mixed breeding, with a goodly sprinkling of dark faces and feet indicative of the free use of the Down crosses. They consisted of ewes and wethers, as in purchasing, care was taken to reject all uncastrated males.

The lambs from Prince Edward Island were light and small, as will be observed by reference to the weights given further on. Some of them showed traces of the Down cross, a few were fairly plump grade lambs of the long-wooled breeds, but the major portion had those rusty, innocent-looking narrow faces which invariably speak of generations of a species of in-breeding which is done in an aimless way. Some were entirely black and some variously striped as we used to see in the days of long ago. In body they were rather light and too long in neck and limb, and lacked considerably in regularity of outline. The breasts were rather narrow, and the same was true of the backs. The heart-girth was somewhat lacking, the fore-arm a little light, and the thigh and twist rather deficient. In a word, they were lacking in that breadth and depth and rotundity and plumpness of form which are inseparably associated with robust lambs that cannot but give good returns for the food fed. But they had excellent appetites, and they had a decided propensity to creep through and under fences to gratify these on the crop of the adjoining fields.

The lambs purchased in the Toronto market were larger in body than those bought in eastern Ontario, and they were leaner in flesh. They were much mixed in breeding and variable in character, and might not unfitly be termed a "truck" lot put upon the market by some venturesome dealer.

In the lots from Prince Edward Island and Toronto there were 164 rams. These were without any exception castrated soon after their arrival, and but one died in consequence of the operation.

The matter of castration and docking at an early age are greatly important. Lambs that are not castrated are unduly developed in the parts of but little value as meat, as the head and neck. They are restless and do not fatten well, and when pastured with ewes to be carried on into the winter, the results are disastrous to all hope of profit from the latter. The quality of the meat is also intrinsically superior in the castrated males.

We would rather castrate the rams, which of course hinders growth for a time, than pasture them as rams; but the proper time to give castration attention is when the lambs are young.

Management on Arrival. The lambs bought in eastern Ontario, and which arrived at the Station on August 29th, were put in a grass paddock and were weighed singly on September 2nd, after having been duly fasted. They were kept on a grass pasture until September 16th, when they were put upon the rape. The first lot from Prince Edward Island arrived September 14th, and were put upon the rape on September 17th. On September 25th they were fasted and weighed singly the following day. Owing to the length of the journey it was thought but fair to allow them to recover from the effects of the long journey before weighing them. The second lot from Prince Edward Island arrived October 7th, and were kept in a grass pasture until October 15th, when they were fasted and weighed as the others had been, after which they also were put upon the rape. Those bought in Toronto, and which arrived 21st October, were weighed singly when they arrived, and were at once put upon the rape with the exception of the newly castrated rams, which were kept upon a grass paddock for several days. In each case the fast continued from 15 to 18 hours. The lambs were all purchased by Mr. J. E. Sorey, the Farm foreman, except the second lot, which came from Prince Edward Island, and all the expenses connected with the purchase and transit are included in the statement of costs.

The average weight of the lambs in each group when weighed at the dates mentioned, the average cost per lamb when laid down at the farm, and the average cost per lb. of live weight, are given in Table lxx :

Date of weighing.	Place where bought.	Average weight of each lamb.	Average cost of each lamb.	Average cost per lb. of live weight.
		lb.	$ c.	cts.
September 2nd	Eastern Ontario	67.54	3 35	4.96
" 26th	Prince Edward Island	53.18	2 76	5.19
October 15th	" " "	59.70	2 99	5.08
" 20th	Toronto	77.74	3 76	4.83

The prices paid, therefore, when the expense of purchase and cost of transit are considered, were relatively dear. The price of lambs throughout the Dominion at the time that these were purchased was abnormally high, hence the material losses incurred by dealers whose terms of contract bound them to lift the lambs before the holiday season. Good lambs could have been purchased in Western Ontario at the same time at a price not exceeding 5 cents per lb. live weight, but our object, as stated before, was to experiment with very common lambs.

The lambs were allowed to remain upon the rape until it was all eaten. They had access at will to an old pasture, a part of which was woodland, the thick underwood of which afforded some protection for the lambs in times of the early snows. As many as 500 fed in one field at one time, and these are the lambs shewn in the sketch published in the Report for 1891, page 103.

The rape crop included 40 acres grown in drills after a crop of rye grown the same season. A part of the rye was made into silage, but the principal portion was cut with the binder early in June, and cured in the shock for winter fodder. (See Annual Report for 1891, p. 53 and 54.) There were also 6 acres grown as a catch crop after winter wheat, some of which was broadcast and some in drills.

Winter Quarters. A lot of 100 lambs were shorn Oct. 13th–16th, and put into winter quarters at night and on stormy days. They were pastured on rape for 28 days after the date mentioned, and were then given 29 cart loads of rape in the sheds, getting a load each day. Full particulars relating to these are given in another part of the report. Two lots of 10 each were selected on Nov. 28th to be fed for experiment as shorn against unshorn, the details of which are also given further on. The remainder were put into winter quarters on Dec. 10th.. As there was not sufficient accommodation

for so many lambs we found it necessary to provide temporary shelter. For this purpose old fence lumber was used. Sheds were erected, involving but little cost and labor. They were divided into three lots, each lot having a shed and a yard in common. The cheaply-constructed feeding-racks and troughs were kept in the open yards There were thus more than 150 lambs in each group. They would doubtless have fed better had they been less crowded.

The lambs were weighed on Dec. 10th, when first put into winter quarters. Owing to the glut in the markets at that time we could not obtain an offer of more than 4⅜ cts. per lb. for immediate shipment. We were strongly advised to sell, but did not do so from the firm conviction that lambs would rise in price as soon as the glut was over. The sequel shows the correctness of this opinion. On Jan. 1st, 1892, we refused an offer of 5¼ cts. per lb. live weight on the whole lot for immediate delivery. The difference between the first and second of these offers in the aggregate value of the lambs is $575. not taking into account food, manure, and attendance for the 21 intervening days. In this fact we have an excellent illustration of the effect of the fluctuation in market values upon the price obtained for any marketable commodity. Because of this it is greatly important that careful attention should be given to this feature of the farmer's work. The difference between the net result as a profit or a loss may easily arise in consequence of the season of the year in which an article is marketed. The aim should be to have live stock come into the market at those seasons of the year when a glut is not likely to occur. Toward the close of the year lambs are likely to be low for some years to come, as the tendency is to rush them into the market at that season to avoid winter feeding; hence those who give attention to the same will be far more likely to get better relative prices.

Food and Feeding. The food given to the lambs consisted of hay, some oats in the sheaf, roots, and a grain ration of oats and peas. The lambs in preparation for England, and those in the experiment as shorn against unshorn, were given in addition a small proportion of bran, and some ensilage. The hay was what may be termed clovery, and it was fed uncut. The roots were sliced, and turnips only were fed. The grain was fed whole. But two feeds were given per day, and water was given in troughs daily. Salt was plentifully supplied. The ration of roots and grain was increased from time to time, but it was found that these small lambs would not take a heavy grain ration.

Estimated Value of the Food. The fodder, the grain, and the roots were estimated at the current market values in Guelph, less the cost of marketing from an Ontario farm under average conditions. The bran was valued at the market price in Guelph, with the cost of delivery added. (See Bulletin lxviii., p. 5.) The home value, therefore, put upon the hay was $9 per ton, the unthreshed oats $6 per ton, the roots sliced 6 cts. per bushel, the oats 26 cts. per bushel, and the peas 50 cts. per bushel. The bran was valued at $14 per ton, and the silage at $2 per ton.

Food Consumed. The amount of food consumed by the lambs, not including the rape from the time they reached the farm until they were delivered for shipment, and the respective values of the same, are as follows:

Food.	lb.		Value.
Hay	54,396	.....	$244 78
Oats in sheaf	4,040	.....	12 12
Oats	57,332	.....	438 42
Peas	11,458	.....	105 03
Bran	3,212	.....	22 48
Roots	128,774	.....	128 77
Silage	9,050	.....	9 05
Total	268,262	.....	960 65

Disposal of the Lambs. The lambs were delivered for shipment as stated in table lxxi. below.

It will be observed that some of the lambs were disposed of at a very low price in the home market. These were ill-doers which had to be sold for what they would bring. The 23 lambs which died from various causes were also charged against the experiment. It will also be observed that the price paid increases with the advance of the season. As statements have been circulated to the effect that the lambs were a losing venture, it may be mentioned here that the figures in the right hand column of Table LXXI, relating to the prices received, and also those in a previous statement relating to the cost of the lambs were compiled from the bursar's books, hence the sources of verification are easily accessible.

TABLE LXXI.

Dates of sales.	Markets.	Number of lambs in each sale.	Weight of each group sold.	Price per lb.	Total value of each group.
			lb.	cts.	$ c.
January 8th	Buffalo	160	13,573	5½	746 51
March 8th	Ontario	50	3,340	5⅝	187 87
" 9th	Halifax	126	11,450	5⅝	644 06
April 12th	"	63	5,900	6	354 00
May 9th	England	99	13,103	7	917 21
April 26th	Ontario	99	8,660	6	519 60
" 12th	Halifax	20	2,738	7	191 66
	Ontario	26	..	..	68 50
	"	17 (skins)	..	..	12 75
	Died on transit or strayed	6	..	..	....
Total					$3,642 16

The only exceptions relate to the lambs sent to England, and to a lot of 10 cull lambs included in those disposed of in Ontario and not yet delivered. The price put upon the lambs prepared for the English market is that which we were offered for them by Mr. L. O. Barber, Guelph, who bought all the others except the culls. This offer was made April 12th and was refused for the reason that we had prepared the lambs for shipment to England. It is the same price as was actually paid by Mr. Barber for a lot of 20 lambs, very similar in kind, which went to Halifax, and which are separately mentioned in the table.

Table LXXII contains a financial summary relating to the whole transaction.

	$ c.
Cost of lambs when bought	2,097 34
" shearing 120 lambs	5 40
" food, including rape and pasture	1,316 25
" attendance	125 00
Total cost	3,543 99
Value of lambs when sold	3,642 16
" wool	56 68
" manure	577 12
Total value	4,275 88
Gain	731 89
Gain per lamb	1 10

The net cash received for the 99 lambs shipped to England would reduce the above gain by $132.10.

The 120 lambs included in the table in the item cost of shearing were shorn for purposes of experiment. All the food given to the lambs from first to last is charged against them. The estimate put upon the rape was the cost of cultivation, as given on page 6, Bulletin LX This makes the cost of growing the rape $8.46 instead of $11.77, as stated in the aforementioned bulletin, owing to the difference in the amount of the manure applied. The cost of producing the 6 acres grown as a catch crop, was estimated at $1.20 per acre, as nearly all of it was sown broadcast and after the necessary autumn plowing of stubble land. It should be remembered that all the rape grown was a second crop

taken from the land during 1891, and that the cultivation given to it left the land in a very clean condition. The whole time of one person was occupied in caring for the lambs, but more than one half of it was given to those animals in the special experiments previously mentioned. But as we would rather understate than overstate results where there is an element of uncertainty, we have charged more than half the wages paid against the lambs. The wool was sold at 13 cents per pound. The manure was valued at half a cent per day per lamb. This estimate is much lower than the value put upon the manure from sheep and lambs by experiment stations which have made this question the subject of careful investigation. More definite information is given on this point where the contingent shipped to England are dealt with in a later portion of the report. As in former bulletins, no account is taken of interest on money, rent of land, exhaustion of natural fertility, or of its increased value resulting from the cleaner tillage.

We now give a concise summary statement of the whole transaction, without taking into consideration the value of the rape eaten, cost of attendance, or value of the manure.

Total cost of 666 lambs, when laid down at Guelph	$2,097 34
Cost of shearing	5 40
Cost of food	960 65
Total cost	$3,063 39
Total returns from 666 lambs and wool shorn	3,698 76
Net gain on 666 lambs	635 37
" " per lamb	95

The net cash profit received from the 99 lambs sent to England would reduce the aforementioned profit by $132.10.

52. Fattening Lambs for the British Market.

This experiment commenced with the arrival of the lambs at the Farm in the months of September and October, 1891. The whole lot of lambs purchased are more fully described in the experiment on fattening lambs which has already been given. It closed when the lambs were sold in Liverpool, shortly after the middle of May following. They left the Farm for the British market on May 11th. It was intended to be substantially a repetition of the experiment, the particulars of which are given in Bulletin LXIX. The principal objects of the experiment were to ascertain: 1. Whether lambs can be fattened at a profit in the autumn and winter for the English market; and 2, Whether the average grade lambs of Ontario and Prince Edward Island are suitable for the purpose.

The Animals Selected. The lambs from which those intended for shipment were selected were purchased by Mr. J. E. Story, the Farm foreman, in the eastern part of Ontario, and in Prince Edward Island. There were purchased in all 666 grade lambs, of which 200 came from eastern Ontario, 362 from Prince Edward Island, and 104 from Toronto. The selections for this experiment were made from the eastern Ontario and Prince Edward Island lambs, 55 from the former lot and 45 from the latter. The lambs were a mixed lot and somewhat below the average of Canadian grade lambs in quality, as will be apparent from the weights given further on. They evidently possessed but little improved blood, and were considerably below what the standard lamb of Ontario should be. In selecting, the preference was given to those having dark faces, although a considerable number were not of this class.

Conditions Governing the Experiment. The lambs selected from the lot purchased in eastern Ontario were weighed on Sept. 1st, two days after their arrival at the Farm. Thirty-seven of those selected from Prince Edward Island were weighed Sept. 26th, twelve days after their arrival, and the remaining 8 from the same place on October 15th, 8 days after their arrival. The average weight of the Ontario lambs was 77.5 lb., and of those from Prince Edward Island 67.9 lb. They were all ear-tagged on reaching the Farm, hence the behavior of each lamb could be traced without difficulty throughout the experiment. From October 13th to 16th they were shorn. They were

then allowed to go together in a closed shed, with yards attached, until the latter part of December, although while the weather continued suitable they were pastured on rape during the day. The shed was then divided into four equal compartments and 25 lambs put in each of these to be fed on different rations. These rations and all the particulars relating to this sub-experiment will be given in connection with the experiment on feeding shorn and unshorn lambs, in a later portion of the report.

Food and Feeding. From the time of the first weighing until October 13th, the lambs were kept on rape all the time. They were then allowed access to the rape only on fine days and were housed at other times, as already mentioned. When inside, they received hay, roots and grain, until the latter part of December, at which time the experiment was commenced, to which reference has already been made. This sub-experiment continued until April 30th. During its continuance, the lambs in one group were fed a mixed grain ration, roots and hay, in a second a grain ration of whole oats with roots and hay, in a third a mixed grain ration with ensilage and hay, and in the fourth a ration similar to that given to the lambs in the first mentioned group, except for a short time at the first. From the close of the sub-experiment until the lambs were shipped on May 11th, they were all fed upon a mixed grain ration with roots and hay. The mixed grain throughout the experiment consisted of oats, peas and bran, fed in the proportions of 2, 2 and 1 parts. The oats and peas were all fed unground. The roots consisted of turnips sliced. The hay was all fed uncut. It consisted of clover and timothy. The grain ration was increased in quantity as the season advanced. It will be noticed that the period of pasturing rape was considerably curtailed by the shearing of the lambs, although some rape was carted to them, in addition to what they got when pasturing, and this is all accounted for in the computation. The ensilage was fed to but one group of lambs, and then only during the continuance of the sub-experiment.

The food consumed by the 100 lambs throughout the experiment was as follows:

Oats	14,344 lb.
Peas	5,099 "
Bran	2,594 "
Roots	43,560 "
Hay	26,587 "
Ensilage	9,050 "
Rape, which grew upon	4.52 acres.

The average daily consumption of food from October 16th to May 11th, exclusive of a very limited quantity of rape given them for a limited period at the first, was:

Grain	1.06 lb.
Roots and ensilage	2.54 "
Hay	1.27 "
Total	4.87 lb.

Estimated Value of the Food. The food was estimated at the current market values in Guelph, less the cost of marketing from an Ontario farm under average conditions. (See Bulletin lxviii.) The home value put upon the food by this mode of reckoning was: Oats, 26 cents per bush.; peas, 50 cents; bran, $14 per ton; roots, sliced, 6 cents per bush.; ensilage, $2 per ton, and hay, $9 per ton. It will be observed that in all probability a profit has already been made on the marketable food used, providing it has been grown upon the farm, as in this experiment the food was charged at the full market values, less the cost of marketing from an average Ontario farm. This profit would be represented by the difference between the cost of growing the food and the market value put upon it.

Weights. It will be observed (Table lxxiii.) that the lambs brought from Prince Edward Island increased more rapidly in weight than those from eastern Ontario, although they were lighter at the outset. They were somewhat leaner in flesh when the experiment started, and this may furnish the explanation. In any case the gains were very satisfactory for the food consumed.

TABLE LXXIII gives a summary and an analysis of weights.

—	The lambs from eastern Ontario.	The lambs from P. E. Island.	The whole lot of 100 lambs.
	lb.	lb.	lb.
Total aggregate weight at commencement			7,322
" " " at close			13,218
" increase in weight			5,896
Average individual weight at commencement	77.50	67.90	73.20
" " " at close	134.90	128.18	132.20
" " increase			58 96
" " daily increase			.25
" increase per month	6.78	9.99	8.39
" " " while on rape			8 51
" " " on winter ration			7.72
" " " without fleece			7.40
" " " with fleece			7.85

TRANSPORTATION. The lambs were put on board the cars at Guelph on May 11th, *en route* for Liverpool. They left in charge of the Farm foreman, Mr. J. E. Story, who accompanied them as far as Montreal, put them on board the steamship, along with the food necessary for the voyage, and secured a competent feeder to care for them on the way.

One of the lot had been sold before the date of shipment to a local butcher, as he was deemed unsuitable for the foreign market. The price obtained was $5. The whole number sent over, therefore was 99. They all stood the voyage well and arrived in Liverpool in good condition.

DISPOSAL OF THE LAMBS. On arriving in Liverpool the lambs were taken in charge by Mr. G. F. Frankland, of Toronto, who found a ready market for them. They brought the highest prices that were then being paid for choice lambs. The following is taken from Mr. Frankland's report:

"England stands pre-eminently first in the judgment of animal food, and when we remember that in her markets are found meats from every clime, besides what Britain furnishes, I feel a certain amount of pride that 99 lambs from the Ontario Government Farm at Guelph could successfully compete with the rich Welsh mutton, and the mountain sheep of Scotland, together with the noted breeds of many shires of England. These 99 young sheep stood in two commodious pens and made an earnest impression upon old sheep breeders as well as feeders from various parts of England, Ireland and Scotland; for most of the onlookers not unnaturally concluded that lambs which would show so good an appearance after having travelled over 3,000 miles by land and sea, must not only have been well nurtured by high class feeding, but that great care must also have been exercised with them throughout their journey. I never observed more careful handling. The dealers began by observing the loin, the tail and the ribs, then turning them over for a glance at the breast, and a careful scrutiny of the neck vein. Their long practice enabled them to fix the weight of the carcasses, very closely. They seldom varied more than one or one and a half pounds. These 99 lambs, which all arrived safely, weighed, I believe, at the College farm 132 lb. 5 oz on an average, and they sold to the highest bidder, a leading butcher of Manchester, for £2 7s. 6d. each. They made a shade over 8½d. per pound, sinking the offal, while sheep which came from South America and which slaughtered well, brought but 6 l. per pound. You would have rejoiced to see the droves of good men of all ages who came to examine your lambs" It may be well also to mention here that these good prices were received in the face of a depressed market for beef. In reference to this Mr. Frankland remarks in the letter from which we have quoted: "In all the years I have been in the trade I never sold at such low prices."

VALUES. The value put upon the lambs at the commencement of the experiment was the actual cost per pound when laid down at the Farm. The actual weights were taken as the basis of computation, and the price per pound charged was the average paid for the

lambs from Ontario and Prince Edward Island respectively. The cost of shearing was put at 5 cents per animal.

TABLE LXXIV. gives the financial results of the experiment.

	$ c.
Cost of 100 lambs when landed at Guelph	368 74
" shearing	5 00
" food	380 83
" attendance	25 00
" shipping to England	357 69
Total cost	1,137 26
Value of 99 lambs in England	1,141 60
" 1 lamb in Ontario	5 00
" wool	44 33
" manure	237 74
Total value	1,428 67
Total gain	291 41
Gain per lamb	2 91

All the food consumed from the time of the arrival of the lambs at the Farm until they landed at the Liverpool docks was charged at market values, less the cost of marketing, as previously stated in detail. The cost of growing the rape was put at $8.46 per acre. In Bulletin LX the cost of growing an acre of rape is put at $11.77. In that estimate, however, a liberal quantity of manure is supposed to have been used, while in the present instance no manure had been applied to the greater portion of the land for the past six years, and a portion of the rape grown was a catch crop. The basis of computation in both instances is exactly the same. The hay, which was the most expensive item of food, was charged at twice the price put upon it in the corresponding experiment of the previous year, owing to the advance in market values. The other food factors were not materially different in price.

The cost of attendance in the corresponding experiment of the previous year was an estimate. In the present instance it is based upon actual experience in caring for the lambs. One man cared for over 600 lambs, so long as that number was here on the Farm, and about half of his time while thus engaged was spent in work of a purely experimental character. We therefore feel safe in assuming that one man will feed and care for 800 lambs when the food is all prepared.

The cost of sending the lambs to England and of selling them there was $357.69, or $3.61 per head, which was 56 cents per head less than in the corresponding experiment of 1891. The following are the items:

Railroad freight charges to Montreal	$ 61 10
Charges of stockyards	4 91
Wharfage	3 28
Loading in ship	2 25
Caretaker on ship	10 00
Food sent from Guelph	19 98
Hay purchased in Montreal	14 95
One hatchet and one fork	1 15
Expenses Mr. Storey, Farm foreman	14 30
Ship's freight and charges, including insurance	170 10
Market charges	3 43
Keep and lairage, nights	7 05
Droving	3 03
Dock charges	7 29
Dues and entry	2 06
Gifts	1 21
Commission for selling, 9d. each	18 03
Cash to Mr. Frankland	14 57
Total	$357 69

The selling of the lambs in England was a purely commercial transaction, and was done on a strictly commercial basis, that is to say, they were sold in the open market and in the ordinary way to the highest bidder.

The autumn shorn wool averaged 3.41 lb. per fleece unwashed, and sold for thirteen cents per pound. The manure made by the one hundred lambs was accurately weighed during the continuance of the sub-experiment, which lasted for four months. The quantity for the balance of the time was computed from the data thus furnished. The amount made during the four months was 34 867 tons, which would give 69.516 tons as the amount made during the whole period. The average amount therefore made per day by each lamb was 5.81 lb., which, on the basis of the valuation given below would be worth .993 of a cent or practically one cent a day. This includes bedding which was not weighed separately. In the corresponding experiment last year the manure was valued at $\frac{3}{4}$ cts per day per lamb. If the cost of the bedding were considered it would somewhat reduce the value of the manure.

Prof. A. E. Shuttleworth, the chemist of the Station, made a careful analysis of the manure, and handed to us the following report in regard to the analysis, and also to the value of the manure:

Organic nitrogen, 12 lb. per ton, worth 17 cts. per pound; total phosphoric acid. 16 8 lb. per ton, worth 3 cts. per pound; muriate of potash, 19.4 lb. per ton, worth 4½ cts. per pound. The commercial value of the manure therefore is $3.42 per ton. By commercial value we mean the value based upon the market prices charged for the three ingredients mentioned when purchased in the form of artificial fertilizers. Since we have stated the amount of the manure made, the reader is given the opportunity of attaching that value to it which may seem proper to him. And here we desire to emphasize the fact that these lambs sold in Liverpool at a cash profit as stated below, without taking into account the value of the manure.

The average individual value of the lambs at the commencement of the experiment was	$ 3 67
The average price for which they sold in Liverpool	11 53
The average advance in value therefore was	7 86
The cash profit which they brought in England without accounting for the manure was	53 67
Or a cash profit per head of	54

The variations in the prices offered for lambs during the past season will be clearly apparent from the following statement:

The price offered per lb., live weight, for our lambs, in Guelph was:

On Dec. 10th, 1891	4⅜ cts.
On Jan. 1st, 1892	5¼ "

The various lots disposed of brought the prices mentioned on the respective dates given, viz.:

Toward the close of January.	5½ cts.
In February	5⅜ "
Early in April	6 "
At Easter	7 "
In England (May)	8.74 "
Equivalent to in Canada	6 "

The above statement certainly tends to remind us of the importance of trying to so arrange our plans that we will not of necessity have to sell in a time of slaughter prices. Such a market is manifestly more likely to occur before the holiday season than after it, at least for some years to come. Owing to the relatively small number of lambs held over for winter fattening, work of this nature not only brings profitable employment in winter, but it tends to the enrichment of our farms.

Conclusions.

The following are some of the more important of the conclusions to be gleaned from this experiment:

1. That grade lambs can be purchased in eastern Ontario and Prince Edward Island respectively, shipped westward more than 300 miles in the one case, and 1,100 miles in the other, fattened, and then disposed of in England at a substantial cash profit.

2. That the average grade lambs of Ontario are well adapted for the work of this experiment.

3. That lambs shipped to England should sell for an advance of about two cents per lb., live weight, on the prices obtainable in Ontario to secure an equal profit.

4. That lambs may be fattened in winter in considerable numbers with but a small percentage of loss from disease or accident.

5. That grade lambs similar to those fed in this experiment can be fattened in good form in winter, when fed daily the following ration: Grain (oats and peas) and bran in the proportions of 2.2 and 1=1.06 lb.; roots, 2.54 lb., and hay 1.27 lb., or a total per day of 4.87 lb.

6. That the ration given in the above conclusion gave an average daily increase in weight of $\frac{1}{4}$ lb.

7. That a ration of rape pasture only, gave a larger increase per day in live weight, than the winter ration used in this experiment.

53. Experiment in Feeding Lambs on Different Rations.

This experiment relates to feeding lambs upon three different rations during the winter season. It may be fitly designated an experiment within an experiment. As the lambs used in conducting it were at the same time being fattened for the British market. The details relating to this experiment have already been given in an earlier portion of the report. The one hundred lambs used in the experiment were divided into four different groups, with twenty-five animals in each group. But for reasons to be given below, the experiment was confined to three lots.

On Dec. 31st, 1891, they were all weighed, and the test commenced the following day. It closed April 30th, thus covering a period of 120 days. The leading object of this sub-experiment was to ascertain the respective values of the various rations used for fattening lambs.

Conditions Governing the Experiment. The one hundred lambs were so divided that those in each of the four groups were nearly equal in quality. They were then put in the four equal sized compartments of the same closed shed, the internal divisions of which were made by feeding racks running across the building. The racks, except those at the two ends of the building were double, and had a close-fitting division adown the centre of each, hence the lambs in each division could take their food on the two opposite sides thereof at the same time. They were thus furnished with ample room for feeding without any crowding. The shed is 76 ft. long and 28 ft. broad, outside measure, hence each compartment was virtually 19 ft. x 28 ft., from which the room occupied by the feeding racks is to be deducted. The ceiling is 9 ft. high, and the food was kept on the loft overhead. Each compartment has a low, wide door, which was kept open all the time, except in the stormiest weather. The yards in front of the compartments, one for each, extended out about 16 ft. from the shed. All the food given them was accurately weighed, and it was given in two feeds daily. They were plentifully supplied with water and salt, but of the former they do not use much when they are fed a liberal ration of roots or ensilage.

Food and Feeding. The lambs in No. 1 group received a ration consisting of grain, bran, roots and hay. The grain ration consisted of oats, peas and bran, fed in the proportions of 2.2 and 1 parts. The roots consisted of turnips and mangels sliced. The hay was principally clover, and it was fed whole. Those in No. 2 group received the same quantity of whole oats by weight as were given of grain and bran to

the lambs in group 1, and roots and hay also the same in character. The lambs in group 3 were fed mixed grains, similar in quantity and quality to those in group 1. In addition they received virtually all the corn ensilage they would eat and also hay. Those in group 4 were fed grain, bran and roots, the same as the lambs in group 1, and in addition all the pea-straw they would eat, but as the pea-straw proved of much poorer quality than was at first anticipated, the experiment with this lot was abandoned. The same quantity of roots was given to the lambs in groups 1 and 2, and the hay was given without limit in each instance, that is to say, they were given all the hay that they would eat clean.

The experiment therefore was a test of the comparative value of a mixed grain ration in one case, as against oats in making mutton, and of the value of ensilage as against roots, for the same purpose in the other. Both objects are unquestionably important, as roots are easily grown anywhere, and corn ensilage can readily be grown in some sections where oats cannot. Table LXXV gives the amount of the various factors consumed by the animals of each group during the experiment.

TABLE LXXV gives the comparative cost of the food consumed by the animals of each group, and also of the increase in live weight made by them.

——	Group 1.	Group 2.	Group 3.
	$ c.	$ c.	$ c.
Total cost of food per group	66 50	65 94	60 17
Average cost of food per day per lamb	2 22	2 20	2 01
Total live weight increase per group	31 46 lb.	33.74 lb.	30.80 lb.
Average weight of increase per lamb per day	.262 lb.	.281 lb.	.257 lb.
Cost of food to produce one pound live weight increase.	8.47 c.	7.93 c.	7.82 c.

CONCLUSIONS.

The following are the chief of the deductions to be made :

1. That in this experiment the ration with oats simply made mutton more quickly and more cheaply than the ration with oats, peas and bran.

2. That in this experiment, while the ration with ensilage did not make mutton quite so quickly as the corresponding ration with roots, it made it more cheaply.

3 That in this experiment the rations given to the lambs in groups two and three, viz : the oat ration with adjuncts, and the ensilage ration with adjuncts, proved about equally valuable for fattening lambs, cost considered.

4. That in this experiment an average daily increase per lamb per group of .267 lb. was secured at a cost for food of 2.14 cts. per day. In other words, every pound of mutton added to the live weight cost 8.07 cts., food only considered.

In the above experiment some of the conclusions are rather surprising, and if confirmed by future experiments they cannot fail to prove of much value. Who, for instance, would have looked for better results from the simple grain ration of oats, than from the time-honored mixture of oats, peas and bran ? If it should be conclusively proved that a grain ration of oats is even as useful for making mutton as the mixed grain ration mentioned, not to say more useful, the gain would be distinct, for it may be fed with less labor. Oats can be grown upon any arable farm in Ontario. This cannot be said of peas, and bran for feeding purposes has to be bought in a majority of instances.

Nor was it to be expected that in fattening lambs a ration of ensilage would be as useful as one of roots. Of course succeeding experiments may give different results, but the result of this one augurs well for the use that may be made of this food factor in the future in fattening lambs. If it shall turn out that corn ensilage may be used with safety and advantage in fattening sheep and lambs, it opens wide the door of opportunity to many who may be desirous of securing more satisfactory prices for the lambs which they raise and sell from year to year.

54. Experiment in Feeding Shorn and Unshorn Lambs in Winter.

This experiment began on Dec. 3rd, 1891, and closed on April 12th following, thus covering a period of 131 days. It is the second of a series of experiments having similar objects in view. The results of the first experiment are given in Bulletin LXVIII, issued in 1891.

The objects of the experiment include the following, viz: (1) To ascertain whether shorn or unshorn lambs will give the best returns for the food consumed in winter. (2) To ascertain the relative gains that will result from liberal feeding at such a time. (3) To ascertain the cost of feeding lambs for fattening purposes in the winter season on the ration used in this experiment. (4) To ascertain the adaptability of the work to the conditions of Ontario.

The Animals Selected. Twenty lambs were chosen from those obtained in eastern Ontario and which reached the farm Aug. 29th, 1891. These lambs are more fully described in the experiment given in an earlier portion of the report which treats of fattening lambs. These lambs, as will be apparent from the weights, were above the average of the lot from eastern Ontario, although they were not above the average of Ontario lambs, speaking in a general way. They were grade lambs of mixed breeding, the blood of the long wools probably being in the ascendant.

Conditions Governing the Experiment. On Nov. 30th the lambs were divided into two groups of ten each. The fleeces were then removed from those of one group. On Dec. 3rd they were all weighed separately and the experiment was then begun. The pens in which they were fed and the yards attached were the same as those used in the the corresponding experiment of the previous year, and which are described in Bulletin LXVIII, p. 4. The lambs in both groups were given the same kinds and the same quantities of food, except in the item of hay, of which they were given all they would take. They were weighed every month.

Food and Feeding. The food fed to the lambs throughout the experiment consisted of hay, grain, bran and roots. The hay was principally clover, and it was fed uncut. The grain and bran rations were made up of 3 parts oats, 2 parts peas, and 1 part wheat bran by weight. The oats and peas were fed whole. The roots consisted of turnips and mangels fed at different seasons, and they were sliced before being fed. The whole was given in two feeds per day, morning and evening. They had water and salt at will.

Estimated Value of the Food. The hay, grain and roots were estimated at the current market values in Guelph, less the cost of marketing from an Ontario farm under average conditions. (See Bulletin LXVIII, p 5.) The home value put upon the hay, therefore, was $9.00 per ton, the oats 26 cents per bushel, the peas 50 cents per bushel, the roots sliced 6 cents per bushel, and the bran reckoned as delivered at the average Ontario farm was put at $14 per ton. It will also be observed, as stated in previous bulletins, that in all probability a profit has already been made on the marketable food used, providing it has been grown upon the farm, as in this experiment the food was charged at the full market values less the cost of marketing from an average Ontario farm. This profit will be represented by the difference between the cost of growing and the value put upon the food.

Food Eaten. The total amount of food eaten by the lambs of each group was the same, except in the case of hay, each group consuming 1,665 lb. grain and bran and 6,550 lb. roots. The unshorn lambs consumed 1,832 lb. hay, and the shorn lambs 1,885 lb. The amount of food eaten per day, therefore by the average lamb was:

Oats	.635 lb.	1.271 lb. grain and bran.
Peas	.424 "	
Bran	.212 "	
Roots	5.000 lb.	
Hay	1.418 lb.	
Total	7.689 lb.	

The ration was uniform and constant throughout, with the exception of the grain portion of it, which was increased at the end of sixty days. It should be remembered that all the hay they would eat was given to the lambs.

In the corresponding experiment of the previous year the average daily consumption of food was 8.81 lb., and with the 100 lambs fed for the British market in the winter of 1891-2 it was but 4.87 lb. The marked difference in the amounts eaten is caused in part by a difference in the size of the lambs, and in part by aiming to finish them in a short season in the one case and in a more prolonged period in the other. It will be interesting to compare the results, when we get sufficient data from which to draw conclusions safely.

Weights. The unshorn lambs weighed on an average 104.25 lb at the commencement of the experiment and 141.61b. at its close. The shorn lambs weighed 101.151b. and 132.3 lb. respectively at the corresponding dates. The increase in weight was considerably greater (a trifle over 6 lb) in the case of the unshorn lambs. Had they been shorn earlier in the season the results might have been different. In the corresponding experiment which is to follow, the lambs will be shorn at a period considerably earlier. The average daily

Table lxxvi gives a summary and an analysis of weights.

	Unshorn.	Shorn.
	lb.	lb.
Weight at commencement	1,042.500	1,011.500
Weight at close	1,416.000	1,323.000
Increase per group	374.500	312.500
Average daily increase per group	2.858	2.385
Average individual increase	37.450	31.250
Average individual daily increase	.286	.239

gain of each lamb was 2.62. lb or a little more than $\frac{1}{4}$ lb. per day. While these lambs consumed daily 2.82 lb. more of a ration very similar in kind to that fed to the lambs in preparation for the market of England, they gained very little more rapidly. This would seem to intimate that we can easily go too fast in our aim to reach results quickly in fattening animals. But there are various other considerations to be taken into the account before we draw any hard and fast conclusions.

Values. The lambs were valued at 5 cents per pound, live weight at the commencement of the experiment. We received an offer of $4\frac{3}{8}$ cents per pound for all the lambs at that time, but they were put at the price named as they were somewhat superior in quality to the average. The cost of shearing was put at 5 cents per head. The attendance was reckoned on the basis that one man would care for 800 lambs when the food is all prepared.

Table lxxvii gives the financial results of the experiment.

	Unshorn lambs.	Shorn lambs.
Cost of animals at commencement of test	$52 10	$50 55
" of shearing	.....	50
" of food	27 73	27 97
" of attendance	1 36	1 36
Total cost	81 19	80 38
Value of animals at close of test	99 12	92 61
" of wool	.....	5 85
" of manure	32 68	32 68
Total value	131 80	131 14
Total gain	50 61	50 76
Gain per cent. on the whole transaction	62 33	63 15

(See experiment in another portion of the Report on Fattening Lambs for the British Market). At the close of the test the lambs were sold to Mr. L. O. Barber, live stock dealer, Guelph, for 7 cents per pound, live weight, who sent them to the Halifax market. The wool from the 10 shorn lambs weighed 45 lb and was sold at 13 cents per lb.

The quantity of the manure was estimated from that made by the lambs sent to Britain, and the major portion of which had been weighed. (See Bulletin LXXVIII.) The estimate was further based on the respective quantities of food consumed daily by the two lots respectively. This gave the output of the manure from 20 lambs as 12.025 tons, or 9.17 lb. per lamb per day.

Professor A. E. Shuttleworth, the chemist of the Station, made a careful analysis of the manure, and handed to us the following report as to the analysis and the commercial value of the three ingredients which are chiefly useful in the same:

Organic nitrogen 9.8 lb. per ton, worth 17 cents per pound.

Total phosphoric acid 12.6 lb. per ton, worth 3 cents per pound.

Muriate of potash 15 lb. per ton, worth 4½ cents per pound.

The commercial value of the manure, therefore, is $2.75 per ton, which would give the value of the amount made per day per lamb as 1¼ cents. The manure in this case did not give so high an analysis as in the case of the lambs fattened for the British market, where it is $3.42 per ton. In the latter instance it did not contain so much water as in the former. A due allowance for bedding would somewhat lessen the value of the manure, but as we have given an approximate estimate of the amount of the manure made, the reader can put that value upon it which may seem best to him.

It will also be observed that there was a net cash gain of $38.73 on the 20 lambs fed or a gain of $1.94 per head, without taking into the account the cost of the attendance or the value of the manure.

Conclusions.

The following are the chief of the conclusions to be drawn from this experiment:

1. That good grade lambs when being fattened in winter may be made to increase .263 lb., or a little more than ¼ lb per day on a daily ration of 1.271 lb grain and bran, 5 lb roots and 1.418 lb. hay, or a total of 7.69 lb.

2. That when the prices of food are as charged in the experiment, such lambs can be fattened at a cost for food per day of 2.12 cents.

3. That in this experiment the autumn shearing of the lambs was of no material advantage, practically.

4. That where there are facilities for the work, good grade lambs can be fattened in the winter at a substantial cash profit.

55. Feeding Swine upon Rape and Meal in the Pen, Rape and Meal in the Field, and Rape alone in the Field.

This experiment was undertaken to learn something regarding rape as a food for swine. Twelve pigs averaging 111 lb. each were selected and divided into three groups on October 11th, 1892. No. 1 group was kept in the pen and fed green rape and 12 lb. of meal daily. No. 2 group was turned into a paddock of green rape and also received meal in the same quantity as those kept in the pen, and No. 3 group was turned into a paddock of rape and received no meal. The animals were all weighed on October 19th and again on November 15th, at which time those from the paddocks were brought into the pens. From November 15th until December 11th each group received all the meal they would consume, but no rape was given. Much of the time that the animals were on rape the weather was very cold and blustery, and the rape was several times frozen. As these animals had been in warm pens previous to the commencement of the experiment and had received meal and slops, rapid gains could not be expected. Notwithstanding the drawbacks the group on rape alone made a gain of 19 lb. and the

group on rape and meal 61 lb. The group in the warm pen which received rape and meal made a gain of 122 lb.

Considering the whole period of 53 days which extended from October 19th until December 11th, and leaving the rape out of the calculation we have the results as follows :

	Meal eaten (lb.	Increase in live weight (lb.)
Group 1	881	265
" 2	1,037	240
" 3	627	160

These figures go to show that group 2 consumed 156 lb. more meal than group 1, and made a live weight record of 25 lb. less. This difference must have been caused by the warm pen as against the cold weather and frozen rape, and not by the food given the two groups of animals, as this was the same in both cases. Leaving the rape out of the calculation we find that group 1 gave an increase of 100 lb. live weight for 332 lb. of meal consumed. This is a rapid gain and shows that the rape must have exerted a considerable influence in the fattening process. The hogs ate the rape well, both in the pen and in the field, and future experiments may prove more definitely the best mode of handling this crop to get the most out of it as a food for swine.

III. CO-OPERATIVE EXPERIMENTS.

56-57. One hundred and fifteen plots were grown at this Station in 1892 in conjunction with 5,088 plots grown by ex-students and other farmers throughout Ontario. The results of the work will be found in the Experimental Union Report at the end of this volume.

IV. WEEDS, AND MODES OF DESTROYING THEM.

(Issued as Bulletin lxxxv.)

That weeds prevail to an alarming extent in the Province of Ontario is patent to every one who has given the subject any attention. That they are on the increase is more than probable. The complete eradication of the more noxious forms of weed life has come to be looked upon as an impossibility by many engaged in tilling the soil, a view which tends to paralyze the efforts that would otherwise be put forth to destroy them. The loss which they cause to the farmers of this province in the large amount of plant food which they take from the soil every year is very great, and the labor expended in efforts to destroy them, often to little purpose, probably represents a still greater loss. Some of them, as the Canada thistle, are pretty generally distributed over the country, and are known to every one, but others, as wild flax, are as yet confined to certain sections, from which they are continually being distributed by the various agencies concerned in their propagation, and frequently they obtain a foothold from which it is difficult to dislodge them, before their presence is known.

Objects of the Bulletin. The chief of the objects of this Bulletin include the following, viz. : 1. To furnish information, through illustrations and otherwise, as to the appearance and habits of growth of the more troublesome forms of weed life which infest this country, that their presence may be at once detected when they are brought into centres where hitherto they have been unknown. 2. To outline certain important general principles that apply, though not always equally, to the destruction of all forms of weed life ; and 3. To give specific modes of destroying the more troublesome forms of weed life which infest this province, that are not necessarily costly, and many of which have been proved in our experience at this Station.

Possible Achievement. In reference to the destruction of the more noxious weeds, our contention is, first, that the more troublesome forms of weed life can be eradicated on every farm in Ontario, if the farmers decide that so it shall be. Second, that this can

be accomplished without heavy outlay when it is done in a certain way. Third, that when weeds are once eradicated it will be easily possible to keep them so with but little outlay. And, fourth, that the profits will be much larger where the farms are kept free from weeds. When we say that the more troublesome forms of weed life can be eradicated, we mean that they can be removed so completely, that they will cease to interfere with any rotation that may be desired, that they can be completely banished from every farm, except in so far as the seeds are brought again by natural and other agencies, and that when so brought, with the necessary vigilance these in turn can be easily destroyed. That this work can be accomplished without heavy outlay has been fully demonstrated by our experience at this station, as stated more fully in the Annual Report for 1891, wherein we claim that the whole farm was brought to a clean condition in three years without the loss of a paying crop, and without resorting to the bare fallow, while in a number of instances two crops were grown the same season. The only outlay for which there was no direct return was labor spent in hand pulling and spudding, which in the three years amounted to not more than $250. The assumption that when weeds are once well overcome, it will not be difficult or costly to keep them at bay, is surely reasonable. That they will come again and keep coming is certainly true. But to affirm that it will cost more to keep them wholly at bay than only partially so, as is sometimes done, is certainly illogical. Our experience during the past year has taught us, that a one hundred acre farm when once in a clean condition may be kept so where the general methods of cultivation are good, without expending a larger sum than $25 per year in spudding and hand pulling. That the profits will be much larger when farms are kept free from weeds is also apparent, since they then use less of the nutriment in the soil that should go to sustain the plants, they injure them less through crowding and overshadowing, and there is certainly less labor involved in subduing them.

Agencies in Weed Distribution. The various agencies by which weeds are distributed are well worthy of attention. Sometimes they are wafted incredibly long distances by the winds of heaven, and are in this way distributed over areas widely separated from one another ; at other times they are violently shaken out of the seed pods in which they grow, and driven along over the crusted surface of the snow for miles at a time. Birds carry them to and fro in their innocency in seeking supplies of food for themselves and their young. Sometimes the seeds are carried by wild animals when seeking their winter stores. At other times the seeds are carried in the droppings of domestic animals from field to field, and those which adhere to the coat are in this way carried to other centres. Some varieties are borne down upon us by the floods which swell the watercourses coming down from infested farms; oftentimes we buy them in the seeds we purchase from abroad, and very often they are brought to us by the threshing machine from a neighbor's farm. And yet again we buy them in the manures that we purchase in cities, towns and villages, and in fodder supplies that come from distances more or less remote, while many carry them from field to field in the manure made upon the farm. It should be kept in mind at the same time, that there are but two ways in which weeds may increase through their own inherent powers, viz., by maturing their seeds, and by means of creeping rootstocks which push their way through the soil, and in this way form new plants. Happily these are both under under our control, so that where weeds are allowed to multiply, it is because suitable measures are not taken to destroy them.

General Principles to be Observed in Destroying Weeds.

There are certain general principles to be observed in destroying weeds, which will be found very helpful in conjunction with the more specific modes that may be required. These include the following :

1. *Study their Habits of Growth.* We should not only study the habits of the growth of weeds, but we should adapt our methods of subduing them accordingly. Weeds are classed as *annuals*, *biennials* and *perennials*. Annuals complete the cycle of their existence in a single year. When annuals are prevented from ripening their seeds upon any farm from year to year, the time must come when that class of weeds will be

completely destroyed. They would be destroyed in a single year, but for the fact that many of the seeds, because of the oily coating in which they are encased, have great power to resist the influences of decay, hence they may remain in the soil for years, and yet retain their vitality. The effort then in destroying annuals should be, first, to prevent them from maturing seeds, and second, to adopt such modes of cultivation as will most quickly force them into germination, that they may be destroyed. These modes include autumn cultivation and the growing of root crops. Biennials complete the cycle of their existence in two years. Many of them are characterized by a tap root, which goes deep into the soil. During the first year large quantities of starch are stored up in the root, and this is utilized during the second year in producing an abundance of seed. It follows, therefore, that any mode of destruction that may be adopted that will prevent this class of weeds from reproducing seeds, will also, in time, effect their destruction. This class of weeds cannot well resist the influence of good cultivation, hence we find them most common in old meadows, pastures, along road-sides, and in by-places generally. In such places persistent cutting must be resorted to.

Perennials live from year to year. Of these there are two classes—the simple, and the creeping perennial. The simple perennial is reproduced from seed only. The ox-eye daisy is a type of this class. The creeping perennial is not only reproduced from seed, but is also propagated by means of rootstocks, which push through the soil. These rootstocks are filled with latent buds, each one of which is capable of sending up a fresh plant under favorable conditions. These favorable conditions are heat and moisture, and a fresh impulse is also given to growth when any disturbing influences, as breaking off from the parent stem through cultivation, is brought to bear upon the roots. Hence it is, that cultivation in moist weather is more likely to promote than to hinder their increase. The Canada thistle furnishes a familiar example of a creeping perennial. In destroying perennials, we must labor to smother them, or to bring the roots to the surface by cultivation, where they will perish by exposure. Any mode of destroying them will be found effective in one season, that will prevent them from breathing through the leaves for several months in the season of growth. But where the attempt is made to destroy them by cultivation which is only partially effective, the residue of the plants left in the land are given exceedingly favorable conditions for development, owing to the loose condition in which the soil is left. Whenever the attempt is made, therefore, to destroy creeping perennials, they should be crushed out, root and branch, in one season. They will come up again through seeds that will linger in the soil, but due watchfulness will soon succeed in removing them.

2. *Drop Certain Crops out of the Rotation.* In the war with weeds it is usually greatly advantageous to drop out of the rotation for a time such crops as allow the weeds which infest them to ripen. Some weeds, as for instance pigeon weed and wild flax, ripen their seeds early, as in winter wheat and hay crops. Others, as ragweed, ripen their seeds late, as in the second cutting of clover. In combatting these various classes of weeds, therefore, the work will be greatly facilitated by dropping the crop out of the rotation for a time in which the weed ripens. As many weeds, however, grow in every variety of crop, this mode is not so applicable to them.

3. *Adopt Methods of Eradication to Conditions of Soil and Climate.* These conditions have an important influence on the growth of weeds. The Canada thistle, for instance, can be destroyed in clay soils with a stiff subsoil, by turning the land into pasture and mowing them twice a year at certain seasons for a limited number of years. On other soils of more open texture, this mode of eradicating them would not succeed.

4. *Allow no Seeds to Mature.* We should not allow any seeds to mature where it is possible to prevent it. It may be very difficult to accomplish this at first, when we undertake to clean a farm, but generally speaking it may be largely prevented by modifying the rotation for a time. The specific modes of hindering weeds from ripening will vary with the species of the weed, and also with the crop. These will be given, in part at least, in a subsequent portion of this bulletin.

5. *Exercise Care in Purchasing Seeds.* The necessity for exercising great care in the purchase of new seeds will be apparent, when we call to mind that it was through this medium that nearly all the foreign weeds came to us that we now possess. They should not only be purchased from reliable seedsmen, but where their presence is detected, they should at all hazards be removed before sowing the grain. They are oftener carried in the seeds of clovers and grasses than in those of cereal grains, hence a particular care should be exercised in the introduction of these.

6. *Give Threshing Machines due Attention.* When these come from farms infested with weeds they should be thoroughly swept before commencing their work, and also allowed to run for a little time when empty to further clean them. Sometimes it is thought advisable for a number of farmers to protect themselves from invasion, by clubbing together and purchasing machines to do their own threshing.

7. *Give Attention to Screenings from the Fanning Mill.* It may be wise in many instances to burn the chaff and screenings which are of little or no value, that have come from winnowed grain. The inferior portions of the grain, usually termed screenings, may be boiled or ground before being fed.

8. *Grow Hoed Crops as far as Practicable.* Hoed crops should be freely grown as far as possible, more especially during the cleaning period. Opportunity is thus given for combatting almost any form of weed life, at almost any period of the growing season. The frequent stirring of the ground is very helpful to the germination of the seeds in the same. Hoed crops are much more effective as aids in destroying weeds, when due attention is given to the cultivation as late as this may be done without injury to the crop.

9. *Grow Clover and Lucerne.* Of the different varieties of clover, the common red is decidedly the most useful for purposes of weed destruction. But few kinds of weeds ripen before this variety of clover, and as it may be cut twice in the year, it is specially helpful in the fight with perennials. Its smothering tendencies are no less helpful when it is a good crop. Lucerne is even more valuable than clover for the purpose indicated, as the cuttings of the lucerne are more frequent than with clover. Sometimes it may be cut as frequently as four times a year, but not always. But it can only be grown on certain kinds of soil, hence its use for the purpose indicated is somewhat circumscribed.

10. *Keep the Land Growing Crops.* In the conflict with weeds the land should be kept busily at work. With some kinds of soil we can easily get two crops a year, and where this is practised, the process will be found very helpful in destroying weeds. The nature of these crops will depend upon climate, soil, and the requirements of the farm.

11. *Stimulate Growth.* Weeds can much more easily be kept in check where the land is stimulated to a vigorous production. When the growth of the crops is strong, more especially early in the season, many forms of weeds are left behind in the race. Growing good crops is another name for good farming, hence good farming is in itself a great hindrance to the multiplication of weeds. The spread of weeds is always much more rapid in impoverished farms.

Growth may be stimulated by improved cultivation, by the application of manures, artificial or homemade, and by growing catch crops for turning under.

12. *Give Attention to Autumn Cultivation.* By autumn cultivation we mean the tilling of the soil after harvest, with a view to the destroying of weeds. No other mode of destroying weeds will probably be found so efficacious for the outlay as this. As soon as the crops are removed, the land that is not sown to grass should be gang-plowed. All weeds that are then growing above the surface are turned under. The seeds of others lying in the soil are encouraged to germinate, and these in turn are again destroyed by harrowing or cultivating, or by the late autumn plowing that precedes the advent of the winter. Catch crops may sometimes be grown on lands plowed at this season.

13. *Do the Work Thoroughly.* When the eradication of weeds is undertaken, it should be as complete as possible, and done in the shortest possible time. The cheapness of the process is usually in direct proportion, first to its completeness, and second, to the brevity of the period occupied in doing it.

14. *Maintain Cleanliness when Secured.* When cleanliness has been secured, it should be maintained from year to year. To effect this two things at least require to be done. The general management of the farm must be good, that good crops ordinarily may be grown, and every portion of it must be gone over once or twice a year with the spud, except the part devoted to hoed crops. When lands have once been made fairly clean, one person will have no difficulty in going over ten acres a day with the spud, and removing from the same all noxious forms of weed life. We have proved this over and over again in our own experience.

15. *Costly Methods.* Two modes of destroying weeds are frequently adopted which are good in themselves, but which we do not favor, because of their costliness. We refer to the bare fallow process, and to the destroying of the seeds through the fermentation of the manure. Both are very expensive, the former in the labor involved, and the latter in the loss of much nitrogen in the manure.

Specific Modes of Destroying our Most Troublesome Weeds.

Nearly all the modes of destroying the different weeds treated of under this heading we have proved in our own experience. Sketches of each weed have been prepared from living specimens, which show the habits of root growth as well as of the portion above ground. We shall speak of eleven of the more troublesome weeds that disturb the agri, culture of Ontario. These are the Canada Thistle, the Corn Sow Thistle, Ox-Eye Daisy-the Burdock, Blueweed, Wild Mustard, Couch Grass, Wild Flax, Pigeon weed, Ragweed and the Wild Oat.

The Canada Thistle.

The Canada Thistle (*Cnicus arvensis*), is a creeping perennial, which grows to the height of two to four feet, according to the character of the soil. It is so universally known in this country, that nothing more needs to be said in regard to its appearance.

This weed comes up early in May, and continues to grow until the time of severe frost in autumn. It comes into blossom in July and August, and also matures its seed in these months, but more especially in August.

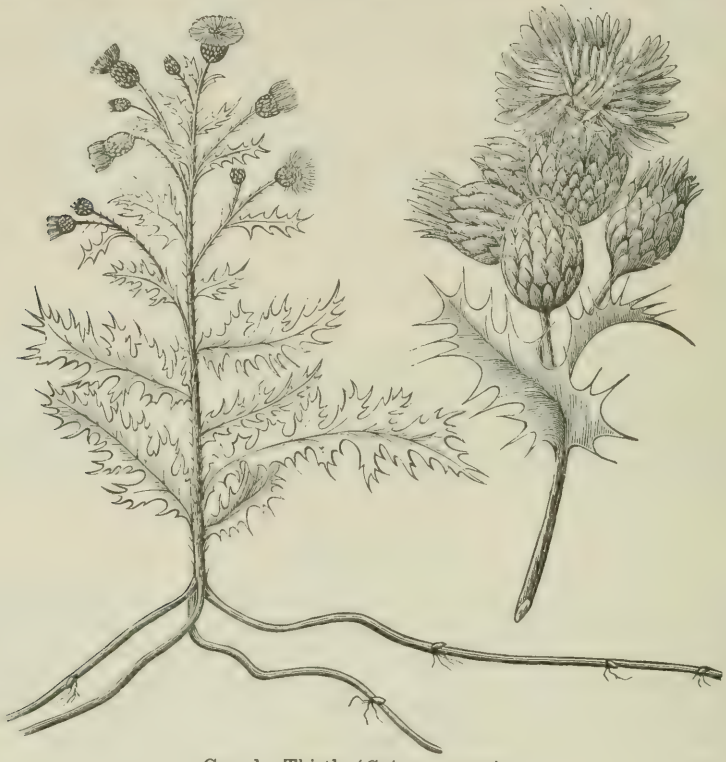
The Canada Thistle will grow in nearly all kinds of soils, but in mucks, with moist bottoms, it does not find a congenial home. It grows amid all kinds of crops, and the seeds ripen along with all the cereal grains, several of the clovers, timothy, and other grasses. It is propagated by means of the seeds, and also through the medium of rootstocks, more especially the latter. The rootstocks, which penetrate the soil horizontally to great distances, are filled with latent buds, which, when the roots become broken, as by the disturbing influences of cultivation, at once spring into vigorous life. The seeds are not only wafted incredible distances with the wind, but they are also scattered through the medium of the seeds of all kinds of cereal grains and some of the clovers and grasses. They are also carried in the manure.

The following are some of the modes of dealing with this intruder :

1. Drop out of the rotation so far as practicable all such crops as allow the thistle seeds to ripen before these are cut, until infested fields have been dealt with.

2. Plow the land immediately after harvest. Plow shallow with any kind of plow that will cut the thistles off clean without breaking off the creeping rootstocks. Keep the thistles from breathing above ground until the late autumn plowing, which should be deep, for the sake of the crop which is to come after. In the spring keep the thistles under by the use of a suitable cultivator, until the time of planting a crop of corn, roots or rape. Give the crop thus planted the horse hoeing necessary to keep down all weed growth, and also keep the thistles cut out of the line of the rows by hand hoeing. Go over the crop if necessary once or twice after the horse cultivation ceases, and there should not be one thistle left. The most effective part of the work has been done the preceding autumn providing the weather at that time has been dry.

3. Plow the ground deeply in August. Sow rye early in September at the rate of $2\frac{1}{2}$ to 3 bush. per acre, and cut the following spring for winter fodder. Then plow the ground deeply with any kind of plow that will effectually bury the stubbles. The jointer with skimmer will answer very well. Then roll at once to conserve the moisture. Harrow once a week until it is time to drill the ground for rape. Drill about the last of June or first of July by using the double mould board plow. The drills may be 22 to 24 inches apart. Sow at once with rape by using the ordinary turnip drill and then cultivate and care for as described in section 2 above. In our experience at this farm we have found this mode of destroying the Canada Thistle to be very effective.



Canada Thistle (*Cnicus arvensis.*)

4. Plow under pasture land in June, or land from which a crop of hay has been removed early in July. Work the land thus plowed upon the surface, so that all thistles will be kept under until the time of sowing winter wheat. Sow the wheat with clover and repeat the process if necessary, after having cut one, two or three crops of the clover. This method is applicable to stiff soils, where winter wheat can be grown. In sections where winter wheat will not grow, substitute for it rye, spring wheat or barley, as may be desired.

5. Where the land has been sown to clover, cut the crop twice for hay, or once for hay and once for seed. Then follow with a hoed crop properly cultivated. The smothering influences of the two crops of clover in one season, and then two cuttings, are very helpful in reducing the thistle.

6. When the thistles are well brought under they should be kept so by the use of the spud. The grain fields should be gone over before harvest to prevent the thistles from blossoming, and after harvest the meadows and fields sown to grass. So far as the destruction of the thistle is concerned, spudding after the blossoming season is more effective than when this is done sooner. Two or three cuttings with the spud after harvest punish the thistles very badly. We have found that by spudding two or three times a

year in the autumn, the thistles soon disappear from the fence borders and bye-places generally.

7. In removing thistles from permanent pastures, we must be governed by the character of the soil and sub-soil as to our mode of procedure. On stiff clays two or three cuttings a year with the scythe or mower for a limited number of years will suffice, but in open sub-soils the spud will have to be resorted to. The first cutting however may be done with the scythe, just before the thistles reach the blossoming stage.

The Sow Thistle.

There are several varieties of this weed, some of which do not give serious trouble to cultivation. It is not an easy task to classify the different varieties, but it will be sufficient for our purpose here to confine our remarks to the variety known as the Corn Sow Thistle (*Sonchus arvensis*), which is by far the most troublesome of this family of plants. The Corn Sow Thistle is a creeping perennial. The plant has an upright habit of growth. It grows to the height of one to three feet, and sometimes it attains to a greater height when the soil is congenial. Like the Canada Thistle it is somewhat branched toward the top. The stems are rather hairy or bristly, especially the flower stems. The prickles upon the leaves are harmless. The stems are hollow, and when wounded a milky juice exudes from them. The blossoms are yellow and the plants are great producers of seed

Sow Thistle (*Sonchus arvensis.*)

The Corn Sow Thistle makes its appearance in May, and continues to grow until autumn. It blossoms in July, and matures its seeds in July, August and September. It will grow in any kind of soil, but is most at home in rich moist loams, and it gives the least trouble in stiff clays.

This weed infests all kinds of crops, and it ripens its seed somewhat earlier than the crops amid which it grows. The only exceptions probably are red clover and lucerne. It is propagated by means of the seeds which float about in the air, owing to the downy attachment which they possess, and as the seeds are very numerous, they increase very fast in the neighborhood of where they are allowed to ripen. This plant also propagates rapidly by mean of its numerous rootstocks, which contain a very large number of buds, as shown in the sketch. The seeds are also conveyed in those of grains and grasses.

The modes of destroying this intruder are essentially the same as those given for the eradication of the Canada thistle.

The Ox-eye Daisy.

The Ox-eye daisy (*Leucanthemum vulgare*), is a simple perennial, with a branching habit of growth. It grows from one to two feet high, according to soil and crop conditions, bnt it is usually not more than one foot in height. It produces large flowers, bordered by white rays. The fancied resemblance of the disc in the center to the eye of an ox has probably originated the name.

The Ox-eye daisy is a very hardy weed. It commences to blossom early in June, and under some conditions, will bloom as late as September. The seeds possess the power of maturing on the stalk, though the latter be cut before they are quite ripe. Although the plants appear singly at first, if allowed to ripen their seeds, they fall and grow again so thickly, that spudding is impossible, hence in pastures, along road sides, and in bye-places where cultivation cannot be introduced, this weed is extremely difficult to eradicate. Live stock will to some extent browse it off when it is young, but they do not relish it, owing to its woody character.

It grows in all soils, but is more vigorous and troublesome in those of loose texture. It infests all kinds of crops, and also road-sides and pastures. It is more difficult to dislodge it from meadows than from any of the other crops of cultivated soils, and more especially as they grow older, as the roots of the plants become interlaced. It is leas troublesome in hoed crops.

This weed is propagated entirely by means of the seed. It is more commonly brought in the seed of timothy and some kinds of clover, but is also conveyed through the medium of cereal grains. It is often taken from field to field on the farm in the manure, and is carried to some extent by birds.

The following include the principal methods of destroying the Ox-eye daisy :

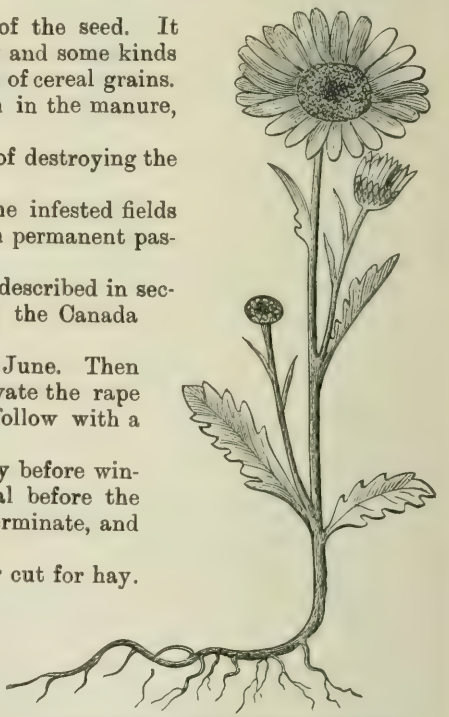
1. Drop meadows out of the rotation until the infested fields have been dealt with. Adopt the same plan with permanent pastures where this may be at all practicable.

2. Grow a crop of rye, followed by rape, as described in section 3, when treating of the modes of destroying the Canada thistle.

3. Pasture meadow-land until the middle of June. Then plow deeply, and sow with rape in drills. Cultivate the rape with sufficient care. It may be necessary to follow with a crop of corn or roots.

4. Plow lightly after harvest, and then deeply before winter. Give one or more harrowings in the interval before the final late plowing, to destroy weeds that may germinate, and follow with one or two hoed crops well cared for.

5. Sow with rye and pasture until June, or cut for hay. Follow the rye with a crop of millet, or if desired, work the ground on the bare fallow system until winter wheat may be sown in September.



Ox-eye Daisy (*Leucanthemum vulgare.*)

General Observations : 1. After cultivation with a view to the destruction of the daisies, the ground should be sown with grass seeds in the crops which come after. These crops should be gone over with the spud, and any daisies found in them destroyed. The same course may be necessary in the meadow which comes later, more especially the first year. 2. In places which cannot to be cultivated, and along fence borders, it is difficult to deal with this pest. Any plan that will prevent it from maturing seeds will doubtless prove effectual, but several years would probably be required to eradicate it by this method.

The Burdock.

The burdock (*Lappa major*), is so common, and at the same time so easily managed, if the work of destroying it is gone about properly, that it would seem almost superfluous to write about the modes that will prove effective in exterminating it. Notwithstanding,

Burdock (*Lappa major.*

it is one of the most universally widespread weeds that we have. The burdock is so well known, that we need not dwell upon a description of it. The sketch illustrates its habits of growth.

As the burdock is a biennial, the first year it does not produce any seeds. It sends a strong tap root down into the soil, hence it is not easily injured by dry weather. It comes into flower chiefly in the months of June and July, but more especially in July. When cut above the crown, even after seed pods are formed, young shoots will be thrown up around the parent stem, and seed matured in some instances within a few inches of the surface of the ground, and long after the usual time for producing seed.

This weed will grow in nearly all soils free from ground water. It is much prone to get a foothold along the fence borders and in bye-places of the farm, but does not give very much trouble where the land is well cultivated. It is propagated solely by means of the seed. It is more commonly carried from place to place through the medium of domestic animals, to the hair and wool of which the burs have become attached.

The burdock may be destroyed as follows:

1. In grain and hay fields the reaping or mowing, as the case may be, will prevent the plants from maturing seeds at the usual season. If the fields are gone over later with the spud or some such implement, and the plants are thus cut below the crown, they must die.

2. In bye-places, as fence sides, lanes, around buildings, and in pastures, they should be destroyed by the use of the spud. The cutting may be done at any time of the year when the ground is not frozen, and will in all cases prove effective in destroying the plants, when they are cut below the crown. Farmers who go over their fields twice a year with the spud will soon have no burdocks.

Blue-weed.

Blue-weed (*Echium vulgare*) is a biennial. It is upright and spreading in its habits of growth, as it has several branches, and it grows to the height of one to three feet, according to the character of the soil. The leaves and stems are covered with numerous hairs, which stiffen with the advancing growth of the plant. The blossom is a deep blue.

Blue-weed sends a strong tap root down deep into the ground the first season, and from this branch off several smaller roots. During the second year the strong plants come into bloom in June, and the weaker ones later, hence the period of bloom extends into the closing days of September. When cut off above the surface during the second year, new shoots at once branch out, and some of them hug the ground so closely, that they are not easily cut clean with the scythe or mower.

This weed grows in various kinds of soil, but its favorite feeding grounds are those which contain much lime. It grows vigorously in gravelly soils, even in some of those used in road making. It is not very troublesome in cultivated areas, but along highways and in pastures, and bye places, it is sometimes a great pest.

Blueweed is more commonly propagated through the agency of the winds, which blow the seeds over the crusted snows both far and near, as the seeds frequently remain in the receptacles wherein they grew on into the winter.

Blue-weed (*Echium vulgare.*)

The following methods will be found effective in combating this weed:

1. Really good cultivation will keep it from getting a foothold to any great extent in cultivated fields. When stray plants put in an appearance, the spud is the most efficient agent in removing them, unless the ground is to be broken up the same season. When cut off at any stage of its growth below the crown the plant must die.

2. In permanent pastures, along roads, and in bye places, any mode of cutting that will prevent the plants from going to seed will remove them in a few years.

3. When fields containing blueweeds are pastured closely during the early part of the season, the growth of seed will be very much hindered. But this agency will not alone suffice to eradicate it.

Wild Mustard.

Wild Mustard (*Brassica sinapistrum*), is one of the most difficult of weeds to dislodge where the plants get an extensive foothold. Owing to the extraordinary vitality of the seeds, it requires many years to destroy all the plants, as they continue to come up in the successive crops. This plant is more or less branched, and has a bright yellow blossom,

Wild Mustard (*Brassica Sinapistrum*).

which can be seen long distances away. In the early stages of the growth, the plants resemble those of the radish or fall turnip. The seeds cannot easily be identified from turnip or rape seed.

Wild mustard is an annual. It comes up early in the season and grows rapidly. The seeds continue to germinate as long as the season of growth lasts. It matures an immense number of seeds in pods about an inch in length. The first flowers appear early in June, and the late plants will produce seeds on into September. Usually it is about eighteen inches high, but sometimes it grows considerably higher. As it cannot withstand severe frosts, it is not found to any considerable extent in meadows, or pastures, or winter grains as wheat or rye.

This plant will grow in any kind of land, but not equally well. It is most at home in friable limestone soils, that possess good drainage, but it will also grow in great luxuriance on praires containing much humus.

It grows vigorously in all kinds of grain crops sown in the spring, and it usually ripens its seeds before the grain is ripe amid which it grows.

Wild mustard is propagated by means of various agencies. Some of the seeds are carried by birds, but usually they find their way to new centres in seed grain. The threshing machine carries them from farm to farm. They are also carried in the droppings of cattle and in the manure.

The following are among the more effective modes of fighting this weed:

1. Drop out of the rotation, as far as possible, the spring crops amid which the mustard grows, until the infested fields have been subjected to a cleaning process. Grow hoed crops at the same time to the greatest extent possible.

2. Grow rye followed by rape, as described in section 3, when speaking of modes of destroying the Canada thistle. Follow the rape with barley or spring wheat sown with grass seeds. If the mustard plants in the spring grain are not too numerous, remove them by hand, otherwise cut the crop for fodder before the mustard is ripe. Where necessary, follow the meadow or pasture as the case may be, with a crop of corn. Spring grains sown with grasses should follow the corn.

3. Give careful attention to autumn cultivation. This reduces the number of the seeds in the upper layer of the soil. Plow deeply before winter for the sake of the crop that comes after, and to expose another section of the soil. Cultivate carefully in the spring until time to plant corn or to sow rape. Follow the hoed crop with spring grain sown with grasses. If thought necessary, a second hoed crop may follow the first before sowing with grass seeds.

4. Sow with rye in autumn, as described in section 2. Cut the rye for hay or ensilage, or plow it under for a green manure. Then cultivate occasionally after the ground has been plowed until the time for sowing winter wheat or rye. The wheat or rye, as the case may be, should be sown with grass seeds. The few plants which may grow in the wheat or rye, may be removed by hand. Whatever method may be adopted at first, hand pulling must be resorted to before the work can be completed.

Couch Grass.

Couch grass (*Triticum repens*) is known by a great variety of names, of which quack grass is the most prominent. It is a creeping perennial, the rootstocks of which are so numerous that they soon fill the soil. They resemble considerably the roots of June grass (*Poa pratense*), but they are much larger and stronger and more vigorous in every way, and they are very much more tenacious of life. The rootstocks are so strong and unyielding that they have been known to push their way through the tuber of the potato. The stems grow about as high as those of timothy, and each one is terminated by a slender spike or head, from two to several inches long. The leaves bear much resemblance to those of timothy, but are somewhat larger.

Couch grass makes a good growth early in the season, and it also furnishes considerable aftermath. It matures it seeds in August. It will grow in almost any kind of soil, but is much more partial to loams and soils of a decidedly open texture. It is least at home in stiff clays, and in these it is much more easily destroyed.

This weed grows in all kinds of crops from early spring until late autumn, and so long as the period of growth continues, the work of propagation goes on through the medium of the roots. Its power to crowd out other crops where it gets a footing is very great.

Couch grass is propagated through the medium of the seeds as well as through that of the rootstocks. As the seeds ripen along with those of nearly all the cereal grains, it is distributed by means of these, and also through the medium of the seeds of various clovers and grasses. The seeds are also distributed in the manure. When the attempt is made to destroy couch grass, effective work should be made of it in a single season.

The following mode of dealing with it will be found successful, unless in seasons that are unduly moist:

Plow lightly after harvest, then harrow with the ordinary harrow, and if necessary use the spring tooth cultivator to shake the roots of the grass free from the soil. Then draw them into light winrows with the horserake, and when dry enough burn them. If the weather should not be dry enough for this, the rootstocks can be carted into the compost heap. Repeat the process a second time, and even a third time the same autumn if the weather will admit of it, plowing more deeply every time to bring up fresh rootstocks. But in any case do not continue the work in wet weather, else the labor will be lost. When the late autumn arrives, rib the land by turning two furrows together from oppo-

site directions, or plow so that the largest possible amount of surface will be exposed to the action of the frost in winter. The frost has the effect, first, of killing the roots of the

Couch Grass (*Triticum repens.*)

exposed portions, and second, of freeing them from the adherent soil. In the spring, use the harrow and cultivator occasionally in time of dry weather, and in case of need also the horserake, until it is time to plant corn, roots or rape. Cultivate this hoed crop properly, giving it what hand work may be necessary along the line of the rows, and by the autumn the couch grass should be all gone, unless the season has been a wet one.

In the fence borders it will be difficult to dislodge this grass without removing the fence for a time, and subjecting the ground to a cleaning process by means of cultivation. Another way when it is found in but small patches would be, to pile manure or straw upon it, and leave the same on long enough to smother it.

Wild Flax.

Wild Flax (*Camelina sativa*), sometimes known as False Flax, is an annual which usually grows about eighteen inches high, but sometimes it grows considerably higher, and when in thick masses many of the plants attain the height of only a few inches. After the blossoming stage the upper portion of the plant consists mainly of stems and seed pods, as shown in the sketch. The blossoms are small, and of a pale yellow color.

This plant is very hardy, and can well withstand the influences of frost. It is more inclined to come up in the autumn. The seeds, which are very numerous, are easily shed. They have some resemblance to the seeds of the common flax, but are much smaller. It is a weed that will grow in any soil adapted to the growth of winter wheat or meadows.

Wild flax infests winter wheat, rye, meadows and pastures. It does not usually grow to any considerable extent in spring crops. When thus found the plants may have germinated in the autumn.

False Flax *(camelina sativa).*

This plant is propagated in the seeds of the crops amid which it grows, in the farm-yard manure, and also to some extent in the droppings of cattle. But the seeds are carried to a greater extent in timothy seed than in that of any other crop.

The following include the principal modes of destroying it :

1. Modify the rotation by dropping out of it for a time in the infested fields such crops as winter wheat, rye and meadows. Grow spring crops instead. One of those may be a hoed crop.

2. Grow two hoed crops in succession when the other conditions will admit of this.

3. Grow rye followed by a hoed crop ; but the rye must not be allowed to ripen.

General Observations. 1. In the conflict with this weed grass seeds should invariably be sown along with spring grains, as wheat or barley. 2. Autumn cultivation is all-important, owing to the natural tendency of the weed to germinate at that season. 3. When wild flax is found only in certain patches in meadows, the infested parts may be cut and used for soiling purposes. 4. When Lucerne can be substituted for meadow, the first cutting would take place before the flax is ripe.

Pigeon Weed.

Pigeon weed (*Lithospermum arvense*), sometimes called Redroot, like wild flax is an annual. It usually grows from eight to sixteen inches high, but sometimes in rich soils it is considerably taller. It is more or less branched in its habits of growth. The leaves

have a somewhat lighter tinge than those of cereal grains and grasses. The flowers are small, and of a pale white color. The seeds are abundant. They cluster along the stems, and they are possessed of much vitality.

Pigeon weed, like wild flax, usually comes up in the autumn of the year previous to that in which it matures its seeds. The blossoms appear during the latter part of May and early in June, hence the seeds ripen before our meadows and winter cereals are cut. Its presence is most easily detected just when it is coming into bloom. It will grow in any kind of soil that is dry, but is most partial to sandy loams.

Pigeon weed (*Lithospermum arvense*).

This weed is troublesome only in crops which mature their seeds early, and which have been sown the previous year. These include winter wheat, rye and meadows, and it is also found in pastures.

Pigeon weed is more commonly propagated through the medium of seed grains, as those of wheat and rye, and of grass seeds, as those of timothy, mammoth clover and alsike clover. It is not carried in the seeds of common red clover. Other agencies in this work are birds, quadrupeds, and threshing machines. It is also distributed in the manure.

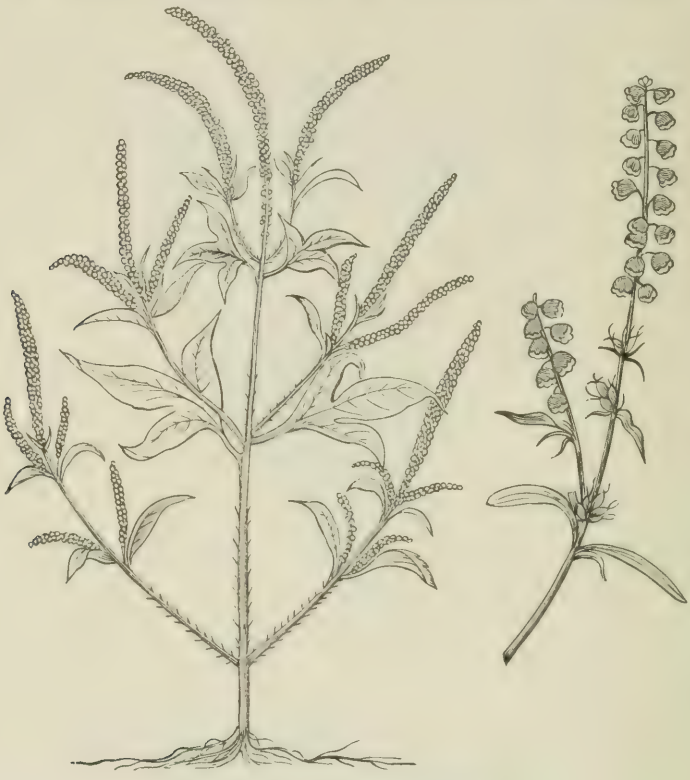
The more effective modes of fighting this weed are essentially the same as those given when treating of wild flax, as these two weeds bear much similarity to one another in the crops which they infest, and also in their habits of growth.

Ragweed.

Ragweed (*Ambrosia Artemisoefolia*) is an annual which possesses a slender and much branched stem. There are several varieties, but the one shown in the sketch is by far the most troublesome. It more commonly grows to the height of 15 to 21 inches, though in some soils, under favorable conditions, it will grow to the height of four feet. The leaves are much serrated in the outer edges, hence the name. The blossom has something

of a yellowish tinge. The buds are small and round and dark in color when ripe, are very numerous, and are chiefly produced on the outer portion of the branches. They are so light that they float readily in water, and are possessed of great vitality.

Ragweed grows late rather than early in the season, so much so that it does not usually ripen its seeds in the cereal crops or in meadows before they are reaped. But in the stubbles of these the plants continue to grow if not disturbed. They blossom from July onward until the time of frost, according to the attendant conditions of growth.



Ragweed (*Ambrosia Artemisiæfolia.*)

Ragweed will grow in all soils free from stagnant water, but it very much prefers friable and loam soils, containing a large amount of humus. It revels in black loams and mucks, but does not make much headway in stiff clays. It matures its seeds in the stubbles after the crops have been removed, in late grain crops, and in clover cut for seed.

It is propagated in the seeds of late maturing cereals, mammoth and alsike clover, and timothy, but more especially in common red clover. The seeds are also distributed by threshing machines, birds, the domestic animals of the farm, and in manures. But no agent is probably more potent in distributing it than water in the time of freshets.

The following include the more effective modes of destroying ragweed:

1. Modify the rotation suitably, and give special attention at the same time to autumn cultivation. As soon as the cereal crops are reaped, the ground should be gang-plowed, or plowed in any way that may be desired. It may then be stirred occasionally before the late fall plowing. Autumn cultivation is particularly helpful in the destruction of ragweed.

2. Grow hoed crops as described in section 3, when treating of wild mustard.

3. Use the mower in the autumn. This can be done when fields are newly sown with grass seeds. Pastures and meadows may be treated in the same way. This will prevent the seeds from ripening in these.

General Observations. 1. When infested meadows or pastures are to be broken up, this may be done, where practicable, before any of the seeds ripen. 2. When the plants are well reduced, hand spudding will soon complete the extermination of this weed. 3. Sheep may be made to render substantial service in cropping this weed while it is yet tender.

The Wild Oat.

The wild oat (*Avena fatua*) is an annual. It bears considerable resemblance to the common oat, but there are some distinctive points of difference. In the wild oat the chaff scales which adhere to the grain are thick and hairy, while in the cultivated varieties, they are not so coarse and are hairless. The wild oat has a long, stiff awn, usually twisted near the base; in the cultivated varieties this is entirely wanting, or if present, is not so stiff and is seldom bent. The grain itself is light, being chiefly made up of hull.

Wild Oat (*Avena fatua*).

This plant matures its seeds in crops of winter wheat, rye and all kinds of spring cereals. It so closely resembles the cereals amid which it grows until the time of coming out in head, that it is practically impossible to remove it by hand before that time, unless when found growing in a crop of peas. It luxuriates in soils well adapted to the growth of cereals, as clay loams, but will grow in nearly all kinds of land. The seed possesses great vitality.

This weed is brought to new centres chiefly through the medium of the seeds of cereal grains, but it also comes down at time of high water from infested fields to lower levels. It is further distributed to some extent in the manure, in the droppings of cattle and through the medium of the threshing machine.

The following modes of combating the wild oat will be found effective:

1. Grow hay, pasture, fodder crops and hoed crops as much as possible until the oats are much reduced, and drop cereal grains out of the rotation so far as practicable for the time being.

2. Break up sod land in the month of June. Cultivate and harrow occasionally until the time of sowing winter wheat, that the seeds of the oats may be induced to germinate

in the upper section of the soil. Sow the wheat with grass seeds, and when the meadow is broken up again repeat the process.

3. Give attention to autumn cultivation, and follow with a hoed crop, as described in section 3, when treating of wild mustard.

4. Grow a crop of rye for fodder, ensilage or pasture, as the case may be, plow the land in June, and manage as described in section 2, above.

5. Cultivate in the autumn, sow early in the spring with oats, peas and vetches, and cut and cure as a fodder crop, and follow this with autumn cultivation, or with a crop of rape grown in drills.

V. GRAIN EXHIBITS.

Exhibit for Ontario during 1892.

The fourth annual exhibit from the Station was presented at the leading exhibitions of Ontario during 1892. At Toronto, London and Kingston the following varieties were shown:

Winter wheat	68	varieties.
Spring wheat	63	"
Barley	67	"
Oats	116	"
Peas	62	"
Corn	76	"

Nearly all of these were shown in the straw, except the peas and corn, and were the growth of 1892. The greater portion of them represented the fourth year's crop from seed imported from Germany, Italy, Sweden, Russia, England, Scotland, Switzerland, Hungary, Greece, Sicily, Egypt, Japan, New Zealand, Australia and the United States. Besides the grain in the straw, glass jars containing samples of grain of the varieties mentioned above were also exhibited.

The exhibit in Toronto occupied the whole end of the Agricultural Hall, being in width fifty feet and in height sixteen feet. In London the display was placed in the dairy building extending along one side for seventy-five feet and in centre reaching a height of about twenty-five feet. The exhibit was made as practical as possible and at the same time was also arranged as neatly as time would permit. Much interest was taken in the exhibit throughout. Those in attendance were kept very busy answering the many questions which were asked by farmers regarding the different varieties presented, the work of the Station and the course of instruction given at the College.

Exhibit for the World's Columbian Exposition.

The Hon. John Dryden, Minister of Agriculture, and Mr. N. Awrey, M. P. P., Commissioner for Ontario at the World's Columbian Exposition, have requested that an exhibit be taken from the Experimental Department of the Agricultural College, and placed at the Exposition to be held in Chicago in 1893. The material for this exhibit is now nearly prepared, and the names of about five hundred varieties of grain and corn have been forwarded to Mr. Awrey to be entered in the catalogue now under preparation. All the varieties forwarded for exhibition have been grown at this Station from one to four years.

VI. EXPERIMENTAL BUILDING.

During the year 1892 upwards of 1,500 plots were devoted to experimental work at this station, over 5,000 packages of grain, seed and fertilizers were distributed among the farmers of Ontario, a large exhibit was prepared for the leading exhibitions of Ontario and another is now under preparation for the World's Columbian Exposition, as

already stated. It is almost impossible to do this work in a truly satisfactory manner with the present accommodation. About 1,000 distinct lots of grain and potatoes are now stored in the cellars and upper rooms of six of the buildings located on the College grounds where, in spite of our efforts, mice are doing serious injury. We are compelled to use nearly the whole of the basement of the chemical laboratory for work rooms and an upper compartment as an office. These are far too small for our work and besides are now greatly needed by the chemical department. Farmers and others visiting the College during the winter season have but a poor opportunity of examining the various products which have been grown upon the experimental plots during the year previous.

It is of great importance that an experimental building be erected upon the College grounds where work would be accomplished during the winter months in preparing grain, seeds, fertilizers, etc., to be used the following season for sowing upon the Station plots, and also for distributing among the farmers of Ontario; where the various products of the experimental plots could be preserved for close examination and for testing in different ways; where the reports could be prepared with the different products close to hand for reference; where an exhibition of all the varieties of grain both in the straw and in the sample jars could be neatly arranged for the benefit of farmers and others visiting the College; and where a general office, a private office, a dark photographic room, and a storage room for fertilizers, etc., could be provided.

THOMAS SHAW,
Professor of Agriculture.

C. A. ZAVITZ,
Experimentalist.

REPORT OF THE MECHANICAL FOREMAN.

To Thos. Shaw, Professor of Agriculture:

Sir,—In writing up the report of the mechanical department for the year ending September 1st, 1891, to October 1st, 1892, I find by turning to the labor journal at page 261, the first record of students' name is dated October 3rd, 1891. The special work on hand was making shipping crates, or in other words, preparing for the annual sale which took place on the 8th of the month, and from that date up to the 21st November we were completing the wire fence along the Dundas road, which was reported upon a year ago. After this was completed we turned our attention to the outside windows about the College and other buildings requiring it. When we had made everything comfortable in this direction about the dwelling-houses, we were then engaged until after Christmas in erecting sheep-racks and grain-bins for experimental feeding. From the 15th December until the 21st there is no record of any student labor in the department—these were the inside examination days—after which there were two of the more advanced students employed in the department during the holidays to complete the grain-bins and erect bookcases in your office. On the 25th January, 1892, the regular College work was resumed. Only two names are entered on that day in the department; they were employed repairing the coach-house doors that had been broken by a wind-storm. From this time up to the 15th February our time was mostly employed in making some repairs about the farm and College buildings and work required for the garden. The record gives the following items: Repairing College ice-house, repairing horse stable doors, repairing weigh scales, repairing windows in bull shed, making gravel screen, etc. On the 16th we began to prepare for the field fences that were to be erected on the middle lane. There were over 1,000 cedar posts peeled and trimmed, and also 28 posts for 14 gates hewn and cased. During the month of March there were some alterations about the horse-stables preparatory to erecting a patent device for feeding. You gave also an order for 500 staking pins for experimental plots and a quantity of marking labels for same. About the 1st of April the outside windows were removed from the College buildings and some necessary repairs

attended to. The principle work, however, for this month was taking down the old fences and re-sawing the old lumber to erect hurdles along the road line in order to protect the fields until the permanent fences should be built. During the month of May the students working in the department were, to a great extent, employed building these hurdles, as there were over 500 rods required.

Some time in May I was instructed by you to confer with President Mills and Prof. Dean about transmitting motion from the engine in the boiler-room at the experimental dairy to the work in class-rooms, a distance of about forty feet. After some deliberation and conference I decided to adopt the Dodge system of transmission, which is now in operation, and I believe giving every satisfaction, being smooth and noiseless in its action, and is in every way well adapted for the purpose, especially where public speaking is required while machinery is in motion. The first week in June was taken up partly by putting fly-screens on the windows of the dwelling-houses, and partly by putting the mechanical tools in proper order required for the examination of the second-year students which took place on the 7th. The number examined this year was 28, and in our usual way, viz.: by performing a piece of mechanical work in a given time. A pattern is shown of what is required, and the test of proficiency is not only that the work will be similar to the pattern, but also that the tools shall be used in a workmanlike manner. For proficiency in every detail there are 60 marks given. There are, besides, several questions to be answered regarding the proper uses and application of mechanical tools such as the following: "1st. The length of the base of a right angle triangle is 16 feet, the perpendicular is $10\frac{2}{3}$ feet, give the extreme ratio of inches on blade and tongue of the steel square that will determine the angles of either end of the third side, and the number of applications that will produce the length. 2nd. Describe the condition of the teeth of a ripping saw when it is at its best for cutting medium hardwood, and give the important points that distinguish between a ripping and cross-cutting saw. State also the reasons for the difference." The above is a fair example of the way in which the mechanical examination is conducted. The article or implement made will vary from year to year according to the requirements of what may be needed for actual use, and, except in one or two instances, the showing this year was very creditable, some of the students taking as high as 95 per cent. of marks.

There was some repairing done this month on the sidewalk leading to the city, and on the 24th I commenced to erect the permanent fence on both sides of the middle lane, and from that date until the 15th of August, with the assistance of two men digging post-holes and with sometimes two and sometimes three students, there were about 1,000 fence posts set up, and also posts for fourteen gates, and from that time up to the 1st September we were engaged building a kitchen and wood-house at one of the dwelling houses. This summary will give a general idea of how the students were employed in the mechanical department from 1st October, 1891, to 1st September, 1892. In closing, I would make the request that $150 be appropriated for the purchase of tools over and above the usual grant for lumber and hardware.

Following is a list of tools in the mechanical department with their present values: 1 turning lathe, $70; 1 vertical drill, $20; 1 small vice, $5; 1 set stocks and eyes, $35; 1 ratchet drill, $3; 1 grindstone, $1.50; 4 work benches, $16; bench planes, $18; other planes, $20; saws, $15; squares, $10; rules, $3; boring braces, $2; augers, $3; boring machine, $4; 1 anvil, $7; tonges, $1; cold-chisels, $1; 2 4-inch slecks, $4; 3 framing chisels, $3; firmer chisels, $2; nail hammers, $6; screw wrench, $1; hand screws, $2; saw sets, $1.50; glue pot, $1; spirit levels, $1; 4 crampits, $1; screw drivers, $2.40; 1 chopping axe, $1; 3 hand axes, $4; 2 adzes, $4; 2 broad axes, $5; 5 draw knives, $5; 4 spokeshaves, $3; 2 oil stones, $1; gimlets and brad-awls, $3; paint brushes, $1.80; tool baskets, $3; ladders, $4; block and tackle, $12; fencing tools, $19. Total value, $325.20.

Your obedient servant,

JAMES McINTOSH,
Mechanical Foreman.

REPORT OF THE FARM FOREMAN.

To Thos. Shaw, Professor of Agriculture:

SIR,—I have the honor of presenting to you my sixth annual report of farm operations and student labor. The crops, so far as we can report, are showing a medium yield only. This, I believe, is owing to the excessive rains which fell during the months of June and July, causing an extra growth of straw which, before maturing, became lodged and broken down to a large extent. I believe fully two-thirds of the crop was broken down at the time of cutting, causing much extra labor in harvesting.

We find it impossible to finish threshing the crops before the end of the year for two reasons. 1st. We can only thresh as the straw is used up for feed and litter from lack of room. 2nd. We can utilize the student labor in making improvements on the roads and farm before the ground is frozen, and in the months of February and March, when it is impossible to do such work, we find it more convenient to do the threshing.

We also found it very difficult to keep the root and corn crops properly cleaned and cultivated during the wet weather of June and July. During the greater part of the month of June the fields were not firm enough to carry a horse, so that we had to employ extra labor in order to eradicate the weeds and cultivate the ground properly when the fields became dry enough to work upon.

As we had no frost before October 1st, the corn crop on the whole was well matured, and is now coming out of the silo sweet and good. The root crop was extra large, especially carrots and Swede turnips. The potato crop suffered seriously from rot.

The student labor for the past year has been very satisfactory, the majority of the class being the sons of practical farmers who take a deep interest in all work entrusted to them. They have been distributed so as to have a direct rotation around nine distinct departments, viz.: Farm proper, experimental, horticultural, mechanical, dairy, live stock, botanical, chemical and engineering, including the running of the portable engine, thresher, grain crusher, cutting boxes and root pulper.

CROPPING.

Field No. 1 (20 acres) was sown to barley on April 22nd. It was divided into six plots of three acres each and sown with the following varieties: Oderbrucker, Mandscheuri, Chevalier, Duckbill, Hallet's Pedigree and selected Canadian Goldthorpe.

On the 27th the remaining two acres were sown with common six-rowed barley. The field was seeded down with a mixture of tall oat and red top grasses, lucerne and alsike clover, which grew up very tall and promises to be a heavy meadow if not injured by winter frosts. The barley promises a very large crop, but is yet unthreshed.

Field No. 2 (17 acres). As I stated in my report of 1891, thirteen acres of the north-west side of this field were sown with rye. The remaining four acres were planted with ensilage corn, two acres of which were used by the dairy department for green fodder. The balance being fairly well matured was put in the farm silo. The rye was cut on June 16th and bound into small sheaves and shocked up, but owing to the excessive rains which followed for about three weeks its usefulness as fodder was destroyed, consequently we were obliged to stack it. We are now passing it through the cutting box and using as litter. The field was plowed and cultivated as soon as the rye shocks were removed, and sown with Dwarf Essex rape in drills twenty-five inches apart. The rape proved a splendid crop, affording feed for one hundred lambs from Oct. 15 to Dec. 15,

Field No. 3 (20 acres). Four acres on the east side were sown with rye last fall, which was cut on the 18th of June, and, like that in No. 2, it was so badly damaged by constant showers that we were obliged to stack it and use it for bedding. Four acres of this field are planted in small trees and are cared for by the horticultural department. The remaining twelve acres are in meadow. It was mown in the first week of July and yielded 2 tons per acre. It was again mown in the last week of September, yielding 1½ tons per acre. On the 8th, 9th and 10th of December we plowed this field in preparation for a corn crop for 1893.

Fields Nos. 4 and 5 (20 acres). This field properly consists of parts of two fields. It is in meadow, and yielded about 2½ tons per acre. As we were favored with fine weather this hay was saved in splendid condition. The plan followed was to cut in the forenoon of each day with two mowers. In the afternoon the tedder was passed through it twice in succession, then late in the evening all the force was put on to cock it. We usually let it stand in cock for three days, and we found it cured with the color and flavor almost as good as when it was growing.

Field No. 6 (20 acres). Ten acres off the south side of the field were sown with eight different kinds of winter wheat, which was put in, cut and threshed by the farm department, and is reported on by the experimentalist, Mr. C. A. Zavitz. The remaining ten acres were sown to rye, which was intended for early cutting, but owing to the continued wet weather of June and July we allowed it to become ripe, when it was cut and threshed in the field. It yielded 27 bushels per acre and is a splendid sample of grain. A portion of it was shipped to different parts of the Province for seed this fall. The field was plowed, cultivated and drilled and sown with rape, which, although sown late, made a fair growth and pastured 240 lambs for three weeks.

Field No. 7 (20 acres) was sown in four plots of five acres each, with the following varieties of oats: Golden Giant, Probsteier, Poland White and White Abundance. The crop was badly lodged by the storms except the Golden Giant, which appeared to have a much stiffer straw, and though a few days later in ripening, was, to all appearance, the finest crop. The Poland White is the only one threshed, and yielded 42 bush. per acre.

Field No. 8 (20 acres) was plowed from sod in October, 1891, being the field in which the Provincial plowing match was held. During the winter months we hauled manure from the barn-yard and piled it in eight large flat piles of not more than 2½ feet in depth, and in the spring we carted and spread it with student labor. We then put on two teams with disc harrows and thus mixed the manure thoroughly with the surface soil. On the 27th of May we commenced seeding it with ensilage corn by using a 12-hoe seed drill. By stopping all but two tubes we were enabled to sow in rows about 42 inches apart, and an average of three grains to the foot. We think it best to sow somewhat thickly as corn is a very uncertain grain in germinating, and if too thick is easily thinned out at the time of hoeing. The varieties of corn were Wilson's True Leaming, Wisconsin Earliest White Dent, Compton's Early, Smut Nose, and Mammoth Cuban. The Smut Nose and Compton's Early, although a much lighter crop, became almost fully matured before being put in the silo. Mammoth Cuban was the earliest of the three large varieties.

The crop of corn was equally divided between the silo belonging to the dairy department and the silo in connection with the farm stables by counting the number of rows of each variety and dividing them equally. The corn was mostly cut by the process of hauling a sled between the rows with a large knife projecting on each side.

Field No. 9 (20 acres) was cropped as follows:

1 acre improved short white carrots, yield 31.9 tons; 1 acre white sugar beets thinned out to about 14 inches apart, yield 18 tons, 52 lb.; 1 acre white sugar beets thinned out to about 7 inches apart, yield 13 tons, 1,634 lb.; ½ acre mammoth red mangels, manured with nine ordinary wagon loads manure from barn-yard, yield 11 tons, 1,968 lb.; ½ acre mammoth red mangels manured with 18 ordinary wagon loads manure from the barn-yard, yield 11 tons, 1,930 lb.; ½ acre Sutton's Champion Swede turnips, manured with nine ordinary wagon loads manure from barn-yard, yield 10 tons, 1,370 lb; ½ acre Sutton's champion Swede turnips, manured with 18 ordinary wagon loads manure from barn yard, yield 12 tons, 1,670 lb.; 1 acre gatepost mangels, which were not weighed, but would, to all appearance, average 10 tons; 5 acres potatoes which suffered from rot so badly that only 66 bags were dug from the plot; 4½ acres Sutton's Champion Swede turnips, which we did not weigh, but which would average 10 tons per acre; 4½ acres Carter's Elephant which was a very heavy crop, but of coarse quality, the turnips having dark streaks through them, and do not promise to keep well.

Field No. 10 (20 acres). About five acres of this field were used for orchard and small fruits, and about two acres for dairy buildings, the balance being used as a pasture for dairy cows.

Field No. 11 (23 acres) was divided off into one-acre plots and sown with spring wheat and oats, except two acres at the east end. The one-acre plots were cultivated and seeded by farm labor and are reported on by the experimentalist, Mr. C. A. Zavitz. Two acres off the east end were sown with Early Bonanza oats, which were so badly rusted and broken down that we were obliged to cut them with a pea harvester and gather them with a hay-rake.

Field No. 12 (17 acres) is meadow and yielded about three tons per acre. It consists of a mixture of timothy, alsike clover, and lucerne and was an extra heavy crop. It grew a splendid aftermath which was pastured off by cows of the dairy department.

Field No. 13 (20 acres) contains five acres now used by the horticultural department for growing small fruits and as orchard. The fifteen acres belonging to the farm department were sown with rye last fall and grew a very heavy crop, averaging five and one-half feet in height. On the 4th of June we commenced cutting it with the binder, making small sheaves. We shocked it in straight rows as far apart as it was convenient for men to carry the sheaves, and immediately started three teams plowing between the rows of shocks. As each land was plowed we cultivated, rolled and drilled into light drills 25 inches apart and sowed rape at once.

Before we could get the rye sufficiently dry to store away the weather became so wet that some of the shocks remained in the field for three weeks, which completely spoiled the rye for feeding purposes and we were obliged to use it for litter.

The rape proved an exceedingly heavy crop, but unfortunately was not the kind ordered. It grew about three feet high, and early in August went into flower resembling a field of wild mustard. In the latter part of August we put in the plows and turned down four acres of that which we thought to be as near to maturity as we could allow it to go lest the seed should fall. We then brought 186 lambs from West Durham Co. and turned them on. We were agreeably surprised to see them attack the flower and seed pods and strip them completely in a few days. When well pastured down we removed the lambs to field No. 3 and plowed No. 13 in preparation for ensilage corn for 1893.

Field No. 14 (24 acres) contains 19 acres controlled by the experimental department and five acres of meadow controlled by the farm. It was seeded in the spring of 1888, with a mixture of one pound each per acre of the following grasses and clovers: Timothy, Orchard, Meadow Fescue, Kentucky Blue, Tall Oat and Italian Rye grass; Alsike Lucerne and common Red Clover. This is not an expensive seeding, and although we can not find a blade of Kentucky Blue or Italian Rye, the other seven varieties have made a splendid showing each year. It was cut on the 5th of July this year and again on the 9th of September, yielding in the two cuttings about four and one-half tons per acre, afterwards growing a fine aftermath. We have had eight cuttings on this field during four years.

Field No. 15 (20 acres) was laid down to permanent pasture by Prof. Brown a number of years ago. A large number of the grasses have disappeared during the past two years, and although still a fine pasture and convenient to the farm buildings, the time has arrived when it should be either broken up or renewed by re-seeding.

Field No. 16 (26 acres) was sown with peas of the following varieties: Twelve acres Prussian Blue, 4 acres Prince Albert, 4 acres D'Auvergne, 1½ acres Canadian Cluster, 3 acres Tall White Marrowfat, 1½ acres Golden Vine.

Field No. 17 (20 acres) was thoroughly drained this year by putting a five-inch pipe diagonally almost across the field in the hollow of a slight watercourse and running in small drains about sixty feet apart, from both sides. It was then sown with rape in drills 25 inches apart, and as in field No. 13 it proved to be the Hybrid rape instead of Dwarf Essex. After pasturing off the north-west half it was plowed by the experimental depart-

ment in preparation for their experiments next year. They purpose dividing it into small plots. The south-east half was completely pastured off, but not in time to have it plowed.

Field No. 18 (13 acres) is entirely controlled by the experimental department as a field for testing grains.

Field No. 19 (30 acres) was this year sown with oats of two varieties, viz. : Eight acres Black Joanette, 32 bush. per acre ; 22 acres White Bavarian, yet unthreshed.

A portion of the ground sown with Black Joanette is high and gravelly, and as this oat requires strong land the yield was below its usual average.

Field No. 21 (12 acres). This field was sown with Oderbrucker barley, one bushel per acre, and seeded with Lucerne clover, 12 lb. per acre. The clover grew almost as high as the barley, and promises, if not winter-killed, to yield a fine crop next year. Barley yielded 27 bush. per acre.

LIVE STOCK.

The live stock at present on the farm represents the following breeds of cattle, sheep, and pigs, and also the horses used on the farm :

Horses.

Ten horses for farm work, $1,400 ; 1 horse for general purposes, $60.

Cattle.

Shorthorns. 1 bull (imported recently), $200 ; 3 cows, $600.

Herefords. 1 bull, $100 ; 2 cows, $300 ; 1 heifer calf, $50.

Galloways. 1 bull (imported), $175 ; 2 cows (imported) $300 ; 1 heifer calf (imp. in dam), $50.

Polled Angus. 1 bull (imp.), $200 ; 1 cow, $200 ; 1 heifer calf, $55.

Sussex. 1 bull (imp. recently), $150 ; 2 cows (imp.), $300 ; 1 heifer calf (imp. in dam), $130.

Norfolk, Red Polled. 1 bull (imp.), $200 ; 2 cows (imp.), $200.

Jersey. 1 bull, $150.

Guernseys. 1 bull (recently imported), $75.

Holsteins. 1 bull, $250.

Ayrshires. 1 bull (imp.), $50.

Grade Cattle. 9 cows, $360 ; 1 Galloway grade steer, $25 ; 6 Shorthorn grade calves, $66 ; 6 2½ year old steers, now fattening, $200 ; 1 Holstein grade calf, $5.

Total value of cattle, $4,391.

Sheep.

Dorset Horns. 1 ram, $40 ; 8 ewes, $200 ; 1 young lamb, $10 ; 2 ewe lambs, $25.

Oxford Downs. 1 ram, $75 ; 4 ewes, $40.

Cotswolds. 1 ram, $40 ; 4 ewes, $100.

Lincolns. 1 ram, $40 ; 1 ewe, $25.

Shropshires. 1 ram, $75 ; 9 ewes, $240 ; 3 ewe lambs (2 at $3, 1 at $4), $10.

Hampshires. 1 ram, $5 ; 4 ewes, $120 ; 1 ewe lamb, $10.

Suffolks. 2 rams, $40 ; 4 ewes, $200 ; 1 ewe lamb, $4.

Leicesters. 1 ram, $40 ; 3 ewes, $60.

Southdowns. 1 ram, $10 ; 5 ewes, $120.

Grades. 110 grades, being fattened, $600

Total value of sheep, $2,129.

Swine.

Berkshires. 1 boar (imp.), $20 ; 1 sow $100.

Tamworths. 1 boar, $30 ; 2 sows, $100.

Improved Yorkshires. 1 boar, $40 ; 3 sows (imp.), $150.

Grades. 11 grade pigs, $77.

Total value of swine, $517.

Total value of live stock, $8,497. Total value of farm implements, $1,921.

Your obedient servant,

J. E. STORY,

Farm Foreman.

PART VIII.

REPORT OF THE PROFESSOR OF DAIRYING.

To the President of the Ontario Agricultural College :

SIR,—I have the honor of submitting the report of the Dairy Department for the year 1892. I shall present it under the following heads :

I. BUILDINGS FOR THE DAIRY.
II. CO-OPERATIVE DAIRYING.
III. DAIRY STOCK.
IV. INSTRUCTION AND EDUCATION.
V. EXPERIMENTAL WORK OF 1892. (1) Feeding; (2) Milking; (3) Testing Milk and Cream; (4) Creaming and Churning.
VI. TRAVELLING DAIRY.
VII. MISCELLANEOUS MATTER.

BUILDINGS FOR THE DAIRY.

Considerable changes and additions have been made in these during the past year. What was formerly the creamery has been changed into a cheese room, with full equipments for the manufacture of cheese. An addition was made to the butter department, and one of the rooms in the old building fitted up for an office. A new piggery, with accommodation for forty hogs, was erected early in the year, while extensive additions to our stabling gives room for thirty milking cows and a number of young stock. This number of cows will furnish us with sufficient milk to carry on experimental work in both butter and cheese. It will also enable us to give better instruction to students. In the past this department has had too limited a supply of milk to give practice to our students in the dairy, with separators, butter extractor, churns, and the manufacture of butter and cheese.

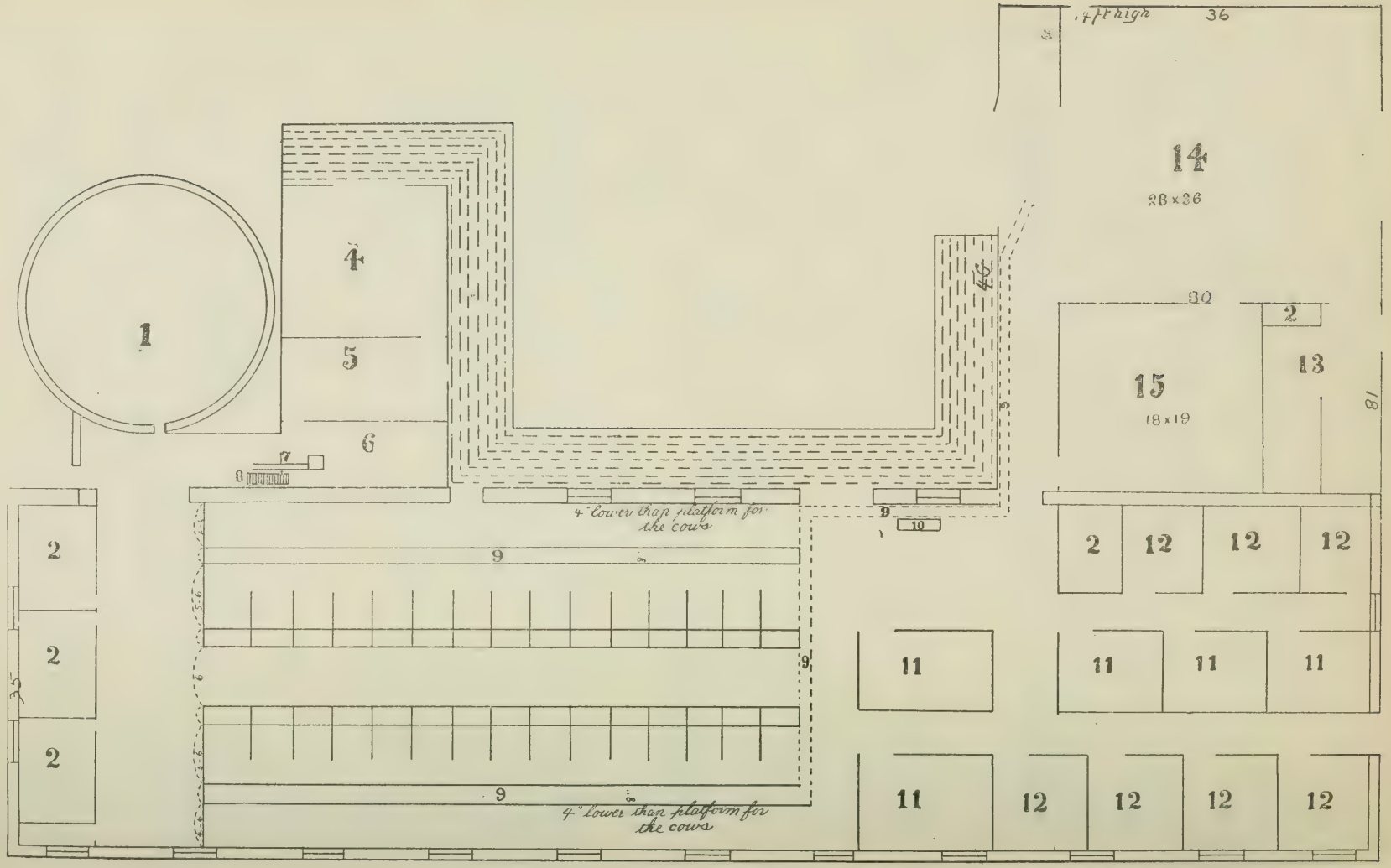
PLAN OF DAIRY BARNS.

1. Silo, 24′ diameter and 29′ deep.
2. Grain bins.
3. Room for cattleman.
4. Tread power. } Root-cellar underneath.
5. Separator room. } Root-cellar underneath.
6. Cut feed. } Root-cellar underneath.
7. Root pulper, with carrier.
8. Stairs leading to root cellar from silo passage.
9. Gutter, with slant to manure shed.
10. Scales,
11. Box stalls.
12. Calf pens.
13. Horse stalls.
14. Covered manure shed.
15. Calf yard (covered).

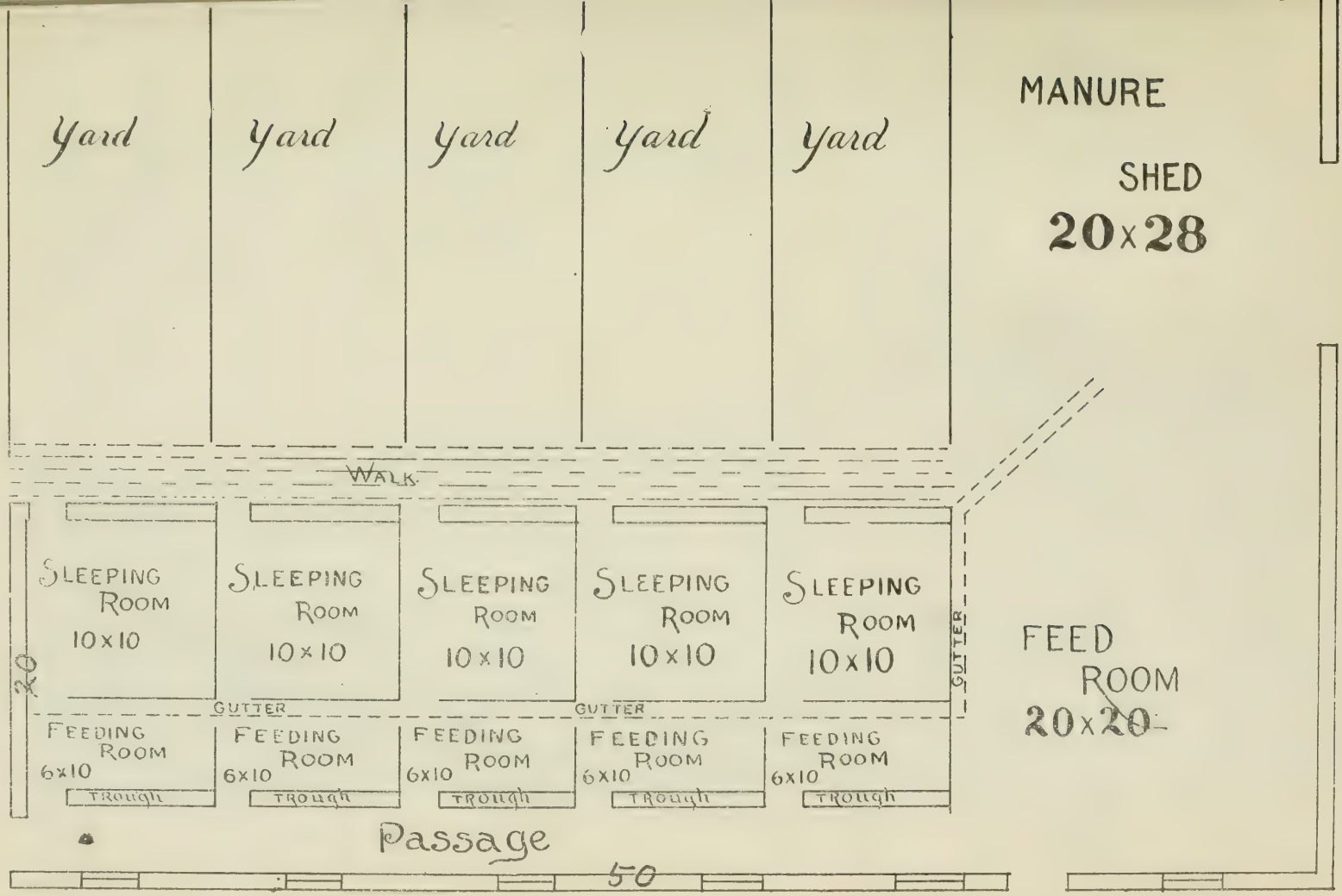
Stalls are single, width 3′, 8″ centres. Mangers 10″ deep; 22″ wide on top and 20″ in bottom. Salt box and iron water box for each stall.

PLAN OF PIGGERY.

The height of ceiling is 8 feet, with loft overhead, except over the manure shed. The floor is laid with with 2-inch plank. On the inside of the studding of the walls is nailed tar paper, thin boards and battens; on the inside, tar paper and matched lumber. For further particulars see diagram.



PLAN OF DAIRY BARNS.



PLAN OF PIGGERY.

CIRCULAR SILO.

The changes in our dairy stabling made it necessary to remove the silo built in 1889 by my predec ssor. This silo was built somewhat differently from the ordinary silo. I quote from the report of that year :

"Silo Construction.

Besides the silo, built in the new main barn buildings, one was constructed in the corner of an old frame barn, all above ground, which was being remodelled for cows for the Experimental Dairy. The plan of its construction was made to differ in some particulars from the directions given in Bulletin xlii on Building a Silo. The finish an the inside of the studs was different on each side of the four sides of the silo.

On one side of the silo, a lining of inch lumber dressed on one side, was nailed on the studs ; this was covered with a sheeting of tar-paper ; on the tar-paper was put a lining of inch lumber dressed on one side, tongued and grooved.

On another side of the silo, the construction on the inside of the studs was similar, with only this difference, that the inside lining of lumber was not tongued and grooved.

On the third side of the silo, the studs were lined on the inside with tar-paper ; on that was nailed horizontally a sheeting of inch lumber tongued and grooved and dressed on the side next the inside of the silo.

On the fourth side of the silo, the finish on the inside of the studs was made by the use of only one thickness of inch lumber neither dressed nor tongued and grooved ; it was nailed on the studs horizontally.

The following concise statement may help to make the difference of inside finish clear to the minds of the readers who have had no experience in silo building :

First side ; studs 2″ × 10″ ; inch lumber dressed on one side ; tar-paper ; inch lumber dressed on one side, tongued and grooved.

Second side : 2″ × 10″ ; inch lumber dressed on one side ; tar-paper ; inch lumber dressed on one side but *not* tongued and grooved.

Third side ; studs 2″ × 10″ ; tar paper ; inch lumber dressed on one side and tongued and grooved.

Fourth side ; studs 2″ × 10″ ; inch lumber as it came from the saw.

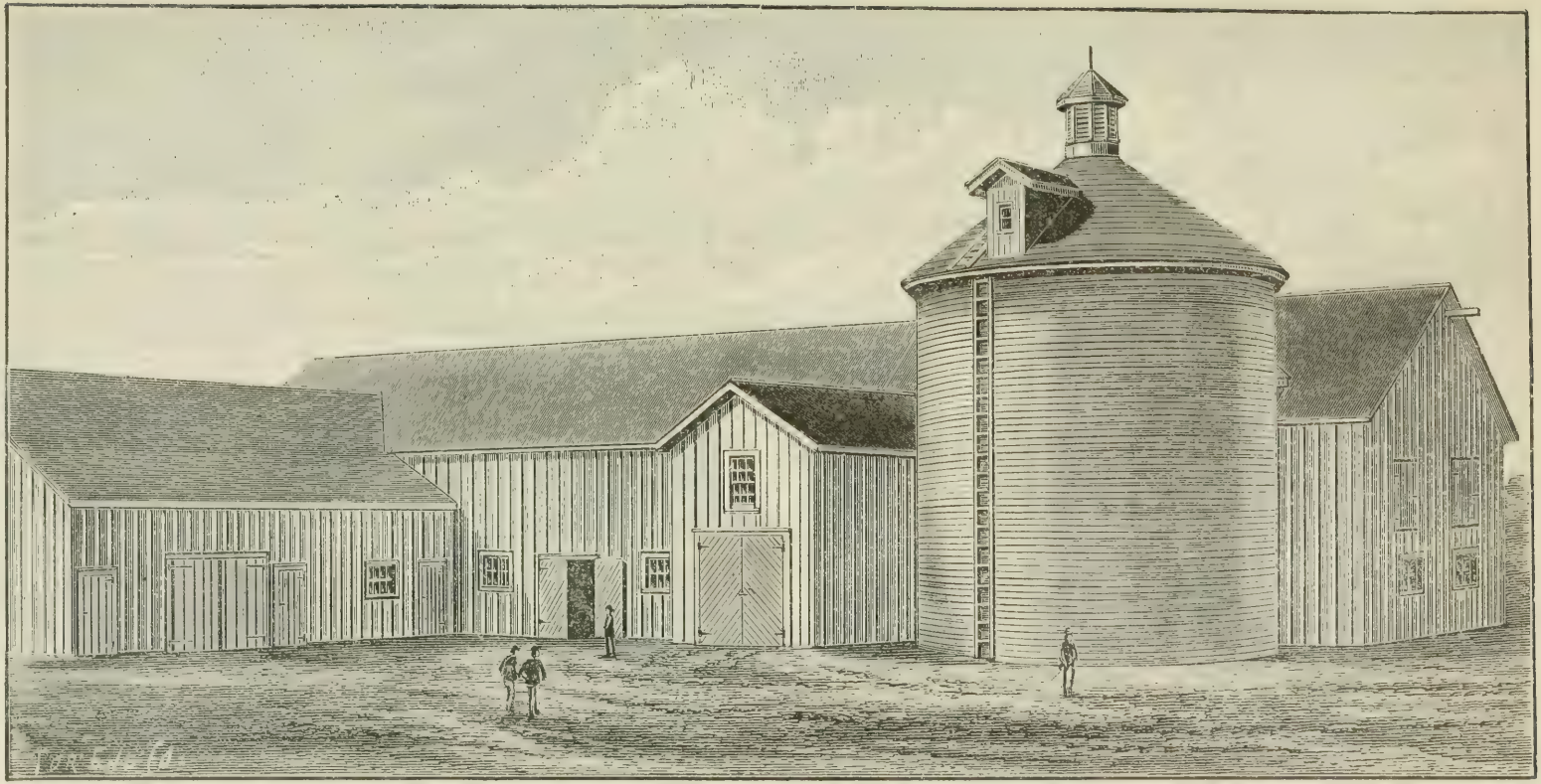
The lumber on all the sides was put on horizontally. The purpose of the differences in the construction of the sides was to discover the cheapest way of building one that would preserve the silage.

I may here anticipate by reporting that up to the time of writing, with the exception of a short distance from the top of the silage, there was practically no waste or spoiling against the *first*, *second* and *third* sides. Against the *fourth* side, the silage was decayed or moulded for a space of from 4 to 6 inches in from the side, for the first six feet from the top of the silage ; below that the waste was confined to a space of about 4 inches around the seam between each two boards."

I may say that after two years' experience with this silo, the side on which there was tar paper and matched inch lumber ("third side") gave as good results as any. The ensilage on the "fourth side" (rough lumber from the saw) was good to the boards—practically no waste—in the bottom six feet of the silo. Above this there was a waste of from two inches to a foot at the top.

After careful examination we could see no difference in the soundness of the lumber in any part of the silo, although it will be noticed that two substances were used with the view of preserving the lumber. It was all sound after three years' use.

To take the place of the one torn down, a circular silo 24 feet inside diameter and 29 feet deep was built. This silo will hold about 250 tons, and cost in the neighborhood of $400, all finished in good style.



DAIRY BARN AND CIRCULAR SILO AT ONTARIO AGRICUTURAL COLLEGE, GUELPH.

Foundation of Circular Silo.

Foundation. The wall is built of stone 18 inches thick and 3½ feet high, being 3 feet under the ground and 6 inches above. The inside of the foundation is flush with the wooden walls above, and projects about one foot on the outside. The earth was excavated to within 6 inches of the bottom of the foundation, giving 3 feet for ensilage below the woodwork. The wall is plastered with Portland cement about ¾ inch thick. The bottom of the silo is coated with gravel, and made perfectly level.

Sills. The sills are 2 inches thick and 4 inches wide, made in sections about 4 feet long, sawn out of 2-inch plank to suit the diameter. They are set flush with the inside of the stone wall, and nailed to pieces of wood which were built in the stone work to catch each joint. A trammel attached to a pivot in the centre was used to get the circle exactly true.

Plates. The plates are built of double inch cut similar to the sills, and nailed together on top of the sills in four sections or quarters. The spaces for studding were then marked on each before commencing to raise.

Studding. The studding are 2″ × 4″, sized the 4-inch way, the ends being simply butted with a piece about 7 feet long, spiked over the joint. Twelve and fourteen foot studding was used, making 26 feet in all. They are spaced to 16-inch centres; toe nailed to sill and plate, and spiked through on top. In raising the studding, two studs were nailed to one section of the plate, and two ropes were attached to help in raising and to hold in place until properly stayed and supported.

Roof. The rafters are 2″ × 6″, sawn from one pattern, and connected to a circle-header at the top 3½ feet in diameter. The boarding is one inch thick, running up and down, and nailed to headers 4 feet apart. The cornice projects 16 inches over the siding.

Walls. Inside the studs was nailed ½-inch lumber, not dressed; on top of this tar paper, and then ½-inch lumber, dressed on one side. Outside is the same, except that the outside layer of lumber is rabbeted.

Ventilator. This is octagon-shaped, 4½ feet inside and 5 feet high to cornice. It can be opened or closed by means of a trap door on hinges, which lies flat on the header where the rafters connect. It is worked by means of sash cord.

Doors. The outside doors are made of ⅞-inch matched lumber, hung with T hinges, and fastened by means of a button. The inside doors are made with same sweep as the inside of the silo, of double half-inch, with tar paper between, and set without hinges. There are three doors for taking out the ensilage. These are placed at suitable distances apart, one above the other. The filling is done at one door placed at the top of the silo and on the opposite side from the doors where the ensilage is taken out.

Cost of Lumber. Following is the bill of lumber for silo 24 feet diameter and 26 feet high:

Studding.	80 pieces 2″ × 4″ × 14′ long.
	80 " 2″ × 4″ × 12′ "
Rafters.	35 " 2″ × 6″ × 14′ "
Boarding.	6,000 feet ½″ siding.
	2,000 " " rabbeted.
	800 " 1″ roof boards.
	8 squares of shingles.
Hardware.	200 lbs. wire nails, 3 ″.
	200 " cut " 2¼″.
	35 " shingle " 1½″.
	8 rolls of tar paper.

Capacity of silo, about 250 tons. Total cost, about $400.

CO-OPERATIVE DAIRYING.

Hints Regarding the Establishing and Equipping of Combined Cheese Factories and Creameries.

It would be quite within the mark to say, that no branch of general agriculture has been so remunerative as the dairy during the last five years, consequently there has been a demand from all parts of the Province for information relative to the establishment of these factories and creameries, and also as to the equipment and management of cheese factories as winter creameries.

At the suggestion of the Minister of Agriculture the following data has been collected to meet this general demand.

Brief History of Co-operative Dairying.

The first cheese dairy on the continent of America managed on the co-operative plan was that owned by Jesse Williams, a farmer of some repute as a cheesemaker, who lived in Oneida County, New York State. He and his son were the first patrons during the year 1851. In 1857 the first factory was erected by Mr. Williams near Rome, N.Y. In 1864 the factory system was introduced into Oxford county, in this Province, by Mr. Harvey Farrington, of Herkimer County, New York State. In 1866 the first factory was started in Hastings county by Mr. Ketchum Graham, and about the same time the first factory in Northumberland county was started by Mr. John Wade and his son Mr. Henry Wade. During the years 1864 to 1867 there was a great development of the co-operative system of cheese-making in the east and west, and more particularly in the west. In 1891 there were reported to the Ontario Bureau of Industries 838 cheese factories and 39 creameries.

1867 saw the Dairymen's Association formed at Ingersoll, Ont. In 1877 the Association divided by mutual consent of its members into the Eastern and Western Dairymen's Association. The dividing line of the territory is that of the agricultural divisions east and west of Toronto. In 1886 the Creameries Association was formed, whose special care is the development of the butter industry, while the other two associations look more particularly after the cheese interests, although winter butter-making in cheese factories is now becoming so important that it is receiving a great deal of attention at their hands. These associations are supported by money grants from the Ontario Government, amounting altogether in 1892, to $6,000, and by fees paid in by members.

Advantages of Co-operative Dairying.

1 A better average article may be produced and also goods of more uniform quality which will consequently bring a higher average price than private dairy goods.

It is possible to make a better quality of cheese or butter in a private dairy than in a factory, in case a person has the necessary skill and conveniences, but only under special circumstances will it pay the dairyman to employ the labor and buy the utensils required. Consequently for the mass of farmers it will be wiser to adopt the co-operative or factory plan in the manufacturing of dairy goods.

2. Butter and cheese can be produced more cheaply, because there is less outlay for labor and capital on the co-operative plan than there would be if each dairyman would buy the utensils and employ the labor necessary to manufacture the milk in his own dairy. The running expenses are also less.

The object of each person engaged in the business should be to produce goods as cheaply as possible. The profits in dairying lie between the price obtained and the cost of producing and marketing. For instance if cheese sells for 10 cents per pound, and it costs 6 cents to produce and market it, a profit of 4 cents per pound is made. But if it sell for 15 cents and it costs 13 cents to produce it a profit of but 2 cents is made on each pound of cheese. *Profits do not depend upon getting a high price*, but in producing as cheaply as possible and then getting the highest available price for the goods.

3. Skilled labor may be employed in manufacturing. This is a day of specialties. A farmer is not expected to be an expert in growing foods, in breeding and rearing dairy stock and also be an expert cheese or butter-maker. Life is too short to accomplish all this. "This one thing I do," holds good in agriculture also. Some one has said that it will soon be one man's business to hold a nail and another man's to drive it.

4. It is possible to extend co-operative dairying to that branch of farming known as the hog industry, which is so closely allied with the dairy. Instead of hauling the whey, skim milk and buttermilk back to the farm for feeding hogs it will be more profitable to feed these hogs at the factory, where there are sufficient by-products to warrant the erection of suitable pens and the engagement of a competent person to feed and care for the animals.

5. There will be more wealth to the mass of farmers, more comfort in the home, less tired, worn-out farmers' wives and daughters, who are already overworked, and lastly, if co-operative dairying is more largely adopted, there will be built up a national industry that will be a source of national pride. This last cannot be accomplished so long as private dairying takes the lead. This is exemplified in our butter trade at present, which is a source of shame and regret to every Canadian, while our cheese trade is pointed to as the pride of the nation, because of its co-operative principles.

Cheese Factory or Creamery?

This question is frequently asked. Several times we have received a postal card with something like the following written upon it :

"We are thinking of starting a cheese factory or a creamery in this neighborhood. Which would you advise us to build?"

The answer to this depends upon circumstances. Of course those who ask are anxious to know which will pay them best. It is money the average farmer is after. A farmer said to me recently, "We are not farming for fun, but farming to make money and we want you to tell us how we are going to make the most money." Judging from the experience of the Province as a whole we should conclude that the cheese factory has paid better than the creamery, as we have over twenty times more cheese factories than creameries. But there are some districts where a cheese factory could not be successfully carried on unless it would be for a short time during the summer, and even then it would be under difficulties. Sections such as parts of Wellington county, Waterloo, Huron, Bruce, a portion of Brant, parts of Simcoe and York, where beef raising and fattening have been a specialty for years—in these sections cheese manufacturing would be difficult, owing to the fact that all the milk would be taken from the farm and there would be none to rear steers for fattening. In such places the creamery will be found more satisfactory, as the skim milk is either left at the farm or returned after separation at the factory.

In other localities where the population is scattered, roads are bad and the cost of transportation high, the creamery would meet with more favor than the cheese factory, and would be more profitable. It is a question that each place must decide for itself after taking into consideration all the circumstances. A general answer would be to build cheese factories in cheese factory sections, creameries in creamery sections and where there are neither, establish according to the local surroundings; but in any case it would be advisable to build so that either cheese or butter may be manufactured without much additional expense, as the future of this industry is to be largely cheese in summer and butter in winter owing chiefly to climatic conditions.

To give an idea of the amount realised for milk at the factories of the Province, I quote the following from the report of Bureau of Industries for 1891 :

Value of product of 100 lb. milk,—

	1891. cents.	1890. cents.	887-91. cents.
Creameries (exclusive of buttermilk)	87.0	79.6	83.2
Butter and cheese factories	103.1	90.2	98.5
Cheese factories	88.5	86.0	90.0

Establishing Factories in New Places.

In localities where the people know very little about the management or requirements of a cheese factory or creamery it is a good plan to secure the services of some competent person to address a public meeting on the advantages and essentials of co-operative dairying. Seek to get the support and influence of some prominent men in the locality, as the majority are apt to wait and see what action half a dozen leading farmers are going to take. If these men support it, then nearly all are likely to fall into line. It would be well at this or some other meeting to divide the territory into say four sections, and appoint a committee of two in each section to canvass the neighborhood and find out the number of cows within a radius of five or six miles, and the number of men who will pledge the milk from their cows for a term of three or five years, if the factory is erected. After this committee reports there will be some data to proceed upon for future operations. Unless the milk from about 300 cows can be secured, or a probability of having this number in the near future, it would not be advisable to build a factory and equip it on a very extensive scale.

The next step would be to select a couple of suitable men to go into cheese and butter districts and gather all the information possible in reference to feeding cows, care of milk and cream, methods of conducting the business, plans of buildings, and all matters pertaining to the dairy. Twenty-five dollars spent in this way may save one hundred and twenty-five dollars in future operations.

The next point to decide is the

Method of Conducting the Factory.

There are several ways of starting and conducting the business, but usually it is either what is known as "private enterprise" or the "joint stock company" plan. In the first, some person or persons agree to build a suitable building, equip it properly, and manufacture the milk or cream at a certain rate per pound, the patrons contracting to furnish the milk from a certain number of cows for a certain number of years. In this case the private individual, running all risks as he does, usually charges a higher rate than the joint stock factories. For cheese the rate usually varies from $1\frac{1}{2}$ cents to $2\frac{1}{2}$ cents per pound, the patrons delivering the milk on the milk stand or at the factory, usually the former. For butter the rate varies from three to five cents per pound.

In the joint stock company method the patrons (and others also) subscribe all or a portion of the money required to build and equip the factory, thus becoming owners of the building and plant as well as of the cows. This method has several advantages, chief of which are—

1. The shareholders, who are chiefly patrons of the factory, have an interest in its welfare, and are more likely to give it hearty support than if it is owned by some one else.

2. The patrons receive the benefit of the profits of manufacture, which may be applied in reducing the cost of manufacture to shareholders to its lowest limit, after all encumbrances have been paid; or a dividend may be declared each year after paying running expenses, cost of repairs, etc.

Some cheese factories are able to haul the milk and manufacture the cheese of shareholders for one cent per pound. (It is usual to charge non-shareholders an excess rate of about one-quarter cent per pound). Unless there are men in the neighborhood likely to succeed as managers, and who will undertake the work, it would be better to start a factory on a private enterprise plan.

To form a joint stock company it will be best to proceed under the Ontario Act of 1888, which provides for the incorporation of cheese and butter manufacturing associations in a very simple manner.

AN ACT TO PROVIDE FOR THE INCORPORATION OF CHEESE AND BUTTER MANUFACTURING ASSOCIATIONS.

[*Assented to 23rd March, 1893.*]

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows :

1.—(1) At any time hereafter, any five or more persons who desire to associate themselves together for the purpose of manufacturing cheese or butter, may make, sign and acknowledge before a notary public, commissioner, or justice of the peace, in duplicate, and file in the office of the registrar of the registry division in which the business is to be carried on, a certificate in writing, in the form mentioned in the schedule to this Act, or to the same effect, together with the rules and regulations, signed by such persons respectively.

(2) The signatures to the rules shall be verified by the affidavit of a subscribing witness thereto, made before a notary public, justice of the peace, or commissioner authorized to take affidavits, or before the registrar or deputy-registrar.

(3) Upon the filing of the certificate and the rules as aforesaid, the members of the association shall become a body corporate, by the name therein described, with the power to hold such lands as are required for the convenient management of their business.

(4) The registrar or deputy-registrar shall, if desired by the person filing the certificate, endorse on the other duplicate certificate and upon the duplicate of the rules certificates of the other duplicates having been filed in his office, with the date of filing, and every such certificate shall be *prima facie* evidence of the facts stated therein and of the incorporation of the association.

(5) All rules made by the association may be repealed, altered or amended by other rules passed at a regular meeting called for that purpose, provided no such new rule shall have any force or effect until a copy, proved by the affidavit of the president or other head officer of the association to be a true copy of the rule or rules passed by the association at a meeting specially called for the purpose of considering the same, has been filed in the registry office in which the certificate of incorporation was filed.

(6) The association shall cause a book to be kept by the secretary, or by some other officer especially charged with that duty, wherein shall be kept,

(*a*) A duplicate of the certificate and of the rules filed as aforesaid in the office of the registrar, so that persons becoming members of the association may sign the said certificate and rules.

(*b*) Any person so desiring to become a member of, or a stockholder in the said association after incorporation as aforesaid, may sign the said certificate and rules in the said book and shall thereupon become such member, and he shall be entitled to the rights and privileges thereof, and shall become liable as such member as fully as though he had signed the certificate prior to the said incorporation of the association.

2. No association shall be registered under a name identical with that by which any other existing association has been registered, or so nearly resembling such name as to be likely to deceive the public.

3. Any certificate so to be filed may designate any one or more places where the business is to be carried on ; but if in different registry divisions, a duplicate must be filed in the registry office of each division.

4. A member of an association incorporated under this Act may have shares therein to an amount mentioned in the by-laws of the association not to exceed $1,000.

5. Before an association commences operations under this Act, they shall agree upon and frame a set of rules for the regulation, government and management of the association, which shall contain—(1) a mode of convening general and special meetings ; (2) provisions for audit of accounts ; (3) power and mode of withdrawal of members ; (4) appointment of managers and other officers and their respective duties, and a provision for filling vacancies caused by death, resignation and other causes.

6. The rules of every association registered under this Act shall bind the association and members thereof to the same extent as if each member had subscribed his name and affixed his seal thereto ; and all moneys payable by any member to the association, in pursuance of said rules, shall be deemed to be a debt due from such member of the association.

7. The capital of the association shall be in shares of such denomination as mentioned in the rules.

8. The shares of the association shall be transferable subject to the consent and approval of the association.

9. All elections shall be by ballot, and each member shall have one vote for each share held by him, in respect of which he is not in default for any calls made thereon.

10. Every dispute between members or between members and the association established under this Act, or any person claiming through or under a member or under the rules of the association, and the directors, treasurer, or other officers thereof, shall be decided by arbitration in manner directed by the rules of the association, and the decision so made shall be binding and conclusive on all parties without appeal.

11. The liability of the shareholders shall be limited, that is to say, no shareholder in such association shall be in any manner liable for or charged with the payment of any debt or demand due by the association beyond the amount of his share or shares subscribed for, and any shareholder having fully paid up the amount of his said share or shares shall be absolved from all further liability.

12. The fees to be charged by the registrar for filing any certificate shall be fifty cents, and for any search relating thereto ten cents.

Norwich Junction Cheese and Butter Manufacturing Co.

The following is a copy of the certificate of the Norwich Junction Cheese and Butter Manufacturing Co. :

Certificate.

Province of Ontario, } We, Henry S. Moore, James Barr, Adam J. Stover, William Stover, Michael
To Wit: } R. Stover, do hereby certify that we desire to form a company or association pursuant to the provisions of the "Act to provide for the incorporation of Cheese and Butter Manfacturing Associations."

The corporate name of the association is to be "The Norwich Junction Cheese and Butter Manufacturing Company, and the objects for which the association is to be formed are the purchase, manufacture and sale of cheese, butter and milk. The number of shares is to be unlimited, and the capital is to consist of shares of twenty-five dollars each, or of such other amount as shall from time to time be determined by the rules of the association. The number of the trustees who shall manage the affairs of the association shall be five, and the names of such trustees are Henry S. Moore, James Barr, Adam J. Stover, William Stover, and Michael R. Stover, and the names of the places where the operations of the said association are to be carried on are the township of North Norwich and the village of Norwich.

Dated Norwich, the 3rd day of September, 1892.

On the back of the certificate are two statements, as follows :

No. 1.—On the 3rd day of September, 1892, before me personally appeared Henry S. Moore, James Barr, Adam J. Stover, William Stover, and Michael R. Stover, to me known to be the individuals described in the written certificate, and they severally before me signed the said certificate, and acknowledged that they signed the same for the purposes therein mentioned.

T. Brown,
A Com'r for taking affidavits.

No. 2.—I hereby certify that a duplicate of the within instrument is filed in the Registry Office of the County of Oxford at 12 o'clock and 40 minutes p.m., the 5th day of September, A.D. 1892.

Geo. W. Pattullo,
Registrar.

RULES AND REGULATIONS.

Following are the Rules and Regulations of the Norwich Junction Cheese and Butter Company:

Shareholders and Shares.

I. The company shall consist of shareholders holding one or more shares of $25 each, who have enrolled their names in a book kept by the Secretary of the company for the purpose.

II. The payment of shares shall be made in such manner and at such times as the directors of the company shall from time to time direct, but in each case the directors shall give at least thirty days' notice in writing to each holder of a share or shares in the company, of such a call upon the stock, and not more than twenty per cent. of the value of the subscribed stock shall be called in at any one time, and not more than thirty per cent. shall be called for within twelve months.

III. The directors shall call in at least ten per cent. of the subscribed capital stock of the company at or before the last distribution of the proceeds from the sale of products in each year until all indebtedness of the company which is not provided for by mortgage or otherwise is paid and satisfied.

IV. In default of payments of all or any such calls upon stock the directors shall proceed to enforce the payment of same by an action of law, or they may in the exercise of their powers sell any such shares and apply the proceeds of the same toward the payment of any unpaid calls or call due in respect of such stock or shares, and the surplus, if any remains after the payment of such arrears and all expenses incurred by the directors of such actions, shall be deposited in some chartered bank to the credit of the defaulting shareholder, and all liability of the directors shall thereby cease.

V. No subscriber for stock shall be accepted as a shareholder or be entitled to hold stock in the company until the same has been duly allotted to him by the board of directors.

VI. Stockholders may sell or transfer their shares, but such sale or transfer must be made with the consent and approval of the directors of the company.

VII. The books of the Secretary for the transfer of stock shall be closed during fifteen days preceeding each annual meeting of the shareholders. The Secretary shall register all transfers of stock in the books of the company, or where furnished with duly executed instruments of transfer signed by both transferor or transferee. A fee of twenty-five cents for each share transferred shall be paid into the general funds of the company. No transfer shall be considered valid until it has been made on the books of the company.

VIII. Each shareholder shall be entitled to one vote for every share which he or she may hold, and shareholders may vote by proxy duly appointed. No person shall be entitled to act as a proxy who is not himself or herself a shareholder of the company.

IX. No shareholder shall be entitled to vote upon any share or shares on which any regular instalment or call has become due and remains unpaid. No shareholder shall be entitled to vote on any stock unless the same has been registered in his or her name in the stock-book of the company at least fifteen days prior to such general or annual meeting of the company.

X. No person shall be entitled to subscribe for or vote upon more than ten shares of the company, either in his or her own right or by proxy.

Officers.

XI. The officers of the company shall consist of a President, Vice-President, Secretary and Treasurer and three Directors. The directors shall be elected at the annual general meeting of the company and shall hold office for one year and until their successors are elected. Shareholders only shall be eligible as directors in the company.

XII. The President, Vice-President and Directors shall constitute the board of directors. All the members shall retire every year, and an election shall take place at the annual general meeting for the appointment of their successors, and all the members of the retiring board of directors, if otherwise qualified, shall be eligible for re-election.

XIII. The President and Vice-President of the company shall be elected at the annual general meeting of the company, or shall be elected from the directors at the first meeting of the board of directors which is held after the annual general meeting of the shareholders.

Powers of Directors.

XIV. The presence of four directors shall constitute a quorum for the transaction of business at a meeting of the directors. The President, or in his absence any director who may be chosen by a majority of those present at such meeting, shall preside, and decide all questions of order subject to an appeal to the board.

XV. If the annual meeting of the shareholders and patrons has not appointed a salesman, then the board of directors shall appoint from their own number or from the shareholders or patrons of the factory a person who shall be salesman of the product of the factory.

XVI. The directors shall also appoint a Secretary and Treasurer, which two offices may be held by one person if the directors so decide, and the President, Vice-President or anyone may hold either office of Secretary or Treasurer or both.

XVII. The President shall have a vote as a director at all meetings, and in addition to that vote in the event of a tie shall have a casting vote as a chairman.

XVIII. The board of directors shall have full power to enter into agreements or contracts with any person or persons to carry on the business of the company, and such person or persons shall have their salaries and remunerations determined by the board of directors, to whom in all cases they shall be directly responsible.

XIX. The directors shall also have full power to determine all salaries and remunerations to officers of the company. But directors shall not be entited to receive more than for each meeting which they attend, unless the same be authorized at the annual general meeting of the shareholders.

XX. The directors may borrow money for the purpose of the company in any manner which seems to them expedient, and their bond, promissory note or other obligation shall bind the company, and they are authorized to hypothecate, mortgage or pledge the real and personal property of the company in order to secure any sum or sums borrowed for the purpose of the company.

XXI. The corporate seal of the company and the signature of the President or other person designed for that purpose at a regular meeting of the board of directors, countersigned by the Secretary and Treasurer, shall be attached to all such instruments or documents pledging the credit of the company, except in the case of promissory notes, which shall be signed by the President and countersigned by the Secretary and Treasurer without attaching the corporate seal.

XXII. The board of directors may appoint from their own number an executive committee, to whom may be added the salesman and Secretary of the company, to whom they may designate executive powers to be exercised under the directions of the board, and they may also appoint standing committees.

XXIII. The directors shall also appoint one auditor to act in conjunction in the auditing of the accounts of the company with an auditor to be elected at the annual general meeting of the shareholders.

XXIV. In case of any vacancy or vacancies accruing in the board of directors between the annual general meetings of the company they may be filled by qualified shareholders by the board of directors.

Duties of Salesman.

XXVII.—(1) The salesman shall use his best endeavors to sell the products of the factory so as to further the interests of the patrons to the best of his judgment and ability.

(2) As soon as practicable after the completion of any sale he shall notify the President and Secretary of the quantities sold, the price agreed upon, particulars of sale, date of shipment, or any other condition or element in the transaction which affects the patrons or manufacturer.

ANNUAL MEETINGS.

XXVIII. The annual meeting of the shareholders shall be held at Town Hall, Norwich, or at such other place in the vicinity as the directors may determine on the first Saturday in February in each year.

XXIX. Notice of time and place of holding of such annual meeting shall be given at least ten days previously thereto in a newspaper circulating in the neighbourhood, and also by postal notice to that effect mailed to each shareholder's address as last registered in the office of the company.

XXX. The rules of order for the annual general meeting shall be :

(1) The meeting call to order by the President or acting President.
(2) The reading and disposal of the minutes of the last meeting.
(3) The reading and disposal of communications.
(4) Reports of standing committee appointed by the general meeting of the shareholders.
(5) Reports of special committees appointed by the general meeting of the shareholders.
(6) Reports of officers including the report of the salesman.
(7) Report of Auditors
(8) Unfinished business.
(9) Nominations and election of officers for the ensuing year.
(10) Appointment of one Auditor.
(11) New business.

SPECIAL MEETINGS.

XXXI. Special meetings of the shareholders may be called by the President or any four of the directors or on the requisition in writing of ten shareholders of the company who may hold one-fourth of the stock (subscribed) of the company, and in every such call or requisition for a special meeting a statement shall be made of the definite purpose for which such special meeting is called, and no other business shall be transacted at such special meeting than shall be mentioned in the notice or notices which have been given calling the same.

XXXII. At least ten days' notice of every special meeting shall be given by advertising the same in a newspaper circulating in the neighborhood, and also by mailing a notice to the same effect to the address of each shareholder as last registered in the office of the company.

XXXIII. Any alteration in the by-laws of the company shall be made only by a two-third vote at the annual general meeting of the shareholders.

XXXIV. A copy of the by-laws shall be at all reasonable hours open for inspection by shareholders at the factory where the business of the company is carried on.

XXXV. If from any cause the annual general meeting shall not be held, or due and legal notice thereof shall not be given, then it shall be the duty of the directors to cause a special general meeting of the shareholders to be called as soon as may be, for the purpose of transacting the business of the annual general meeting, and all matters may be dealt with and acted upon as if such meeting were in effect the annual general meeting of the shareholders of the company.

Dated, the 3rd day of September, 1892.

DUTIES OF A SECRETARY OF A CHEESE OR BUTTER ASSOCIATION.

1. The Secretary shall keep an accurate record of the minutes of the annual meetings, special meetings of shareholders, and of meetings of the Board of Directors.

2. He shall keep an accurate account of all financial transactions of the Company.

3. He shall keep a stock book for the proper recording of the ownership and transfers of shares in the Company.

4. He shall render an accurate statement to each of the patrons of the company of his or her account therewith from time to time.

5. He shall prepare an annual statement of the business of the Company, for the annual meeting and also for each patron. He shall also send an account of the affairs of the Company to the Ontario Bureau of Industries at Toronto.

DUTIES OF TREASURER.

1. The Treasurer shall deposit all moneys received by him in some reliable bank, as treasurer of the Company.

2. He shall pay the same always, and only, on the order of the President, duly countersigned by the Secretary.

3. He shall present vouchers for all expenditures to the Auditors and shall present a statement of receipts and expenditures of the Company to the annual general meeting of the shareholders.

HINTS TO PATRONS.

1 Keep none but the best cows, such cows as will give at least 6,000 pounds of milk in a year, or produce 225 pounds of butter-fat. To secure such, select the best

grade cows in the herd and breed them to pure-bred males of a milking breed. Rear the heifer calves, giving them special feeding and training for the dairy. Breed these heifers to drop their first calf at from two to two-and-a-half years old. Manage the herd in such a way that at least half the cows drop their calves between October 1st and February 1st, for the winter dairy.

2. Provide a succession of green crops during the summer to partially or wholly supplement pastures. Rye sown in the autumn makes an early green crop. The clovers follow, after which pease and oats or tares and oats, sown two or three times at intervals of ten days. Corn comes next, and is most valuable in the dairy for fall and winter feeding. This crop should never be sown thickly, but in rows or hills about three feet apart, that it may be thoroughly cultivated. Such a system of feeding will prevent the cows drying up at a time when butter and cheese bring the highest price. A supply of pure water and access to salt at all times is necessary to obtain the best results.

3. Send to the factory, nothing but clean, healthy, pure milk, of good quality and then demand pay according to its value, or the per cent. of fat contained, instead of in proportion to the poor milk, skim milk, or water furnished by other patrons.

4. Cleanliness in the pasture field, stable, in milking and in care of the milk is very important, while neglect to strain the milk through a goood strainer should not be allowed. Milk for cheese factories and separator creameries should be aerated by pouring, dipping, or by the use of one of the many aerators in the market. The can of milk should be protected from rain and sun, and be free from bad odors of any kind.

5. It will be better to have the whey fed at or near the factory, but where it is returned to the farm see that the can is emptied and washed immediately on its return. Hogs should not be fed within 100 feet of the milk stand.

6. Where cream is supplied to a creamery the milk should be set in deep cans in ice water, or in water that will cool the milk to 45 degrees in less than twelve hours. If ice is not used the water surrounding the cans should be changed at least twice within two hours after setting. Aim to keep the cream sweet by keeping it in cold water until the driver calls for it. Where ten or more good cows are kept it will pay to use a small cream separator especially in winter.

Mottoes.

For Milk and Cream Haulers :

Cleanliness, despatch, carefulness, honesty and punctuality.

For Cheese Factories and Creameries :

Cleanliness inside and outside, with goods of finest quality on the shelves, or in the store room, and honest dealing with every patron. (It will pay manufacturers to send a small pamphlet once a year to each patron, setting forth the proper methods of caring for milk or cream).

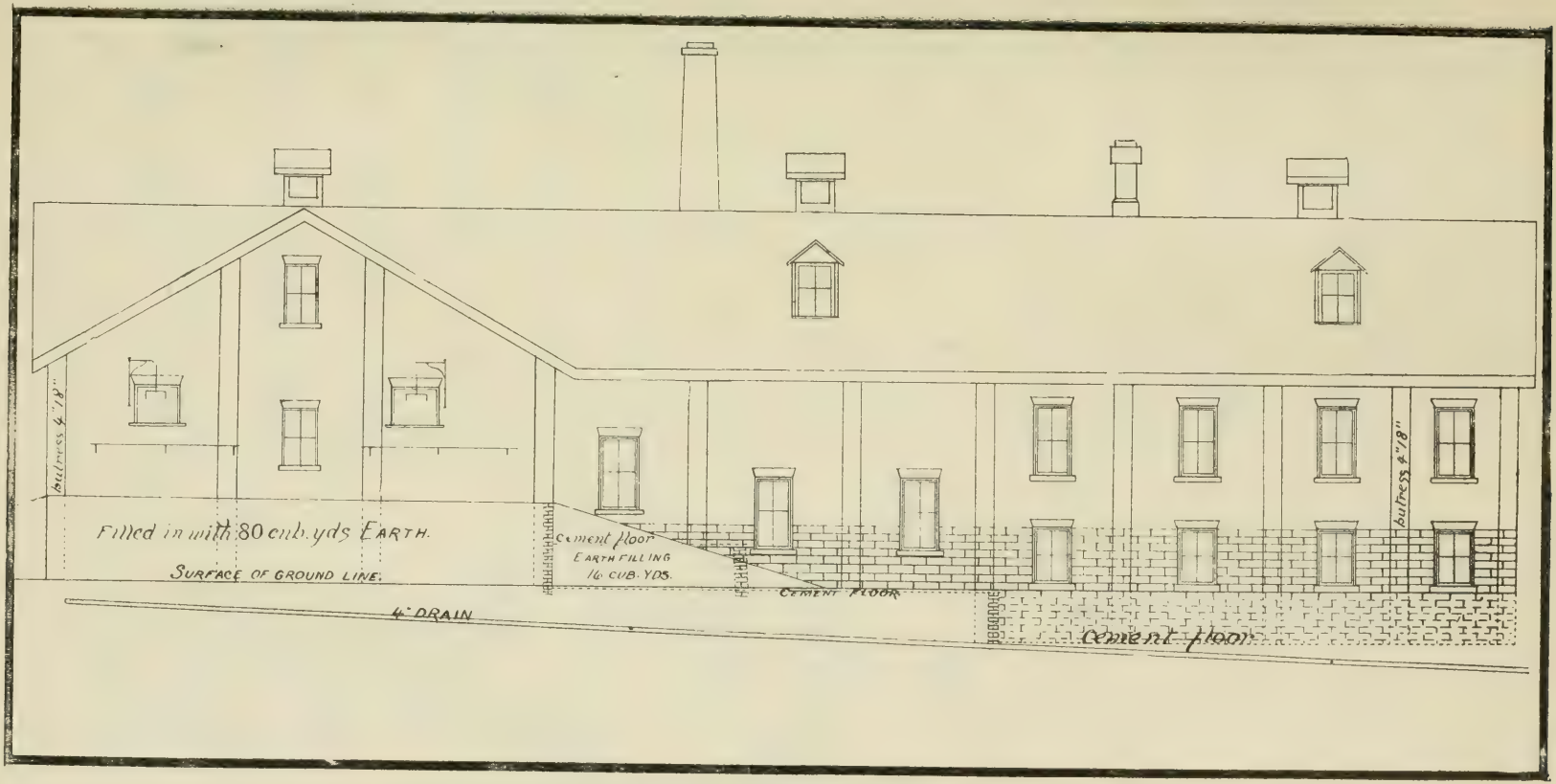
For all concerned :

We are bound to produce the best goods made in any factory in the Province.

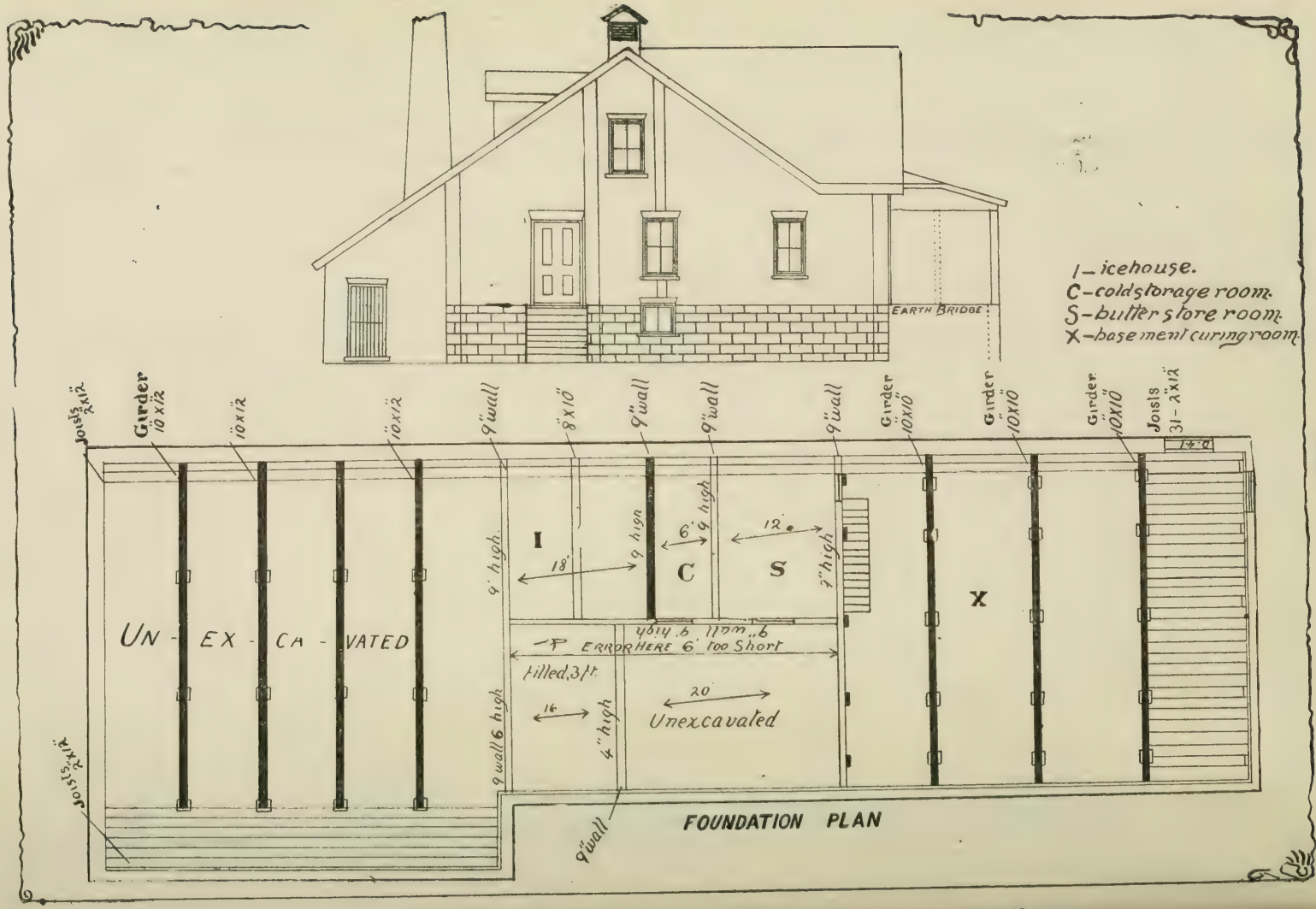
Hints on Building Cheese Factories and Creameries.

In selecting a site, choose one that will be central to the locality ; one that may be easily drained, and having good roads leading to it ; and one that is abundantly supplied with pure cold water.

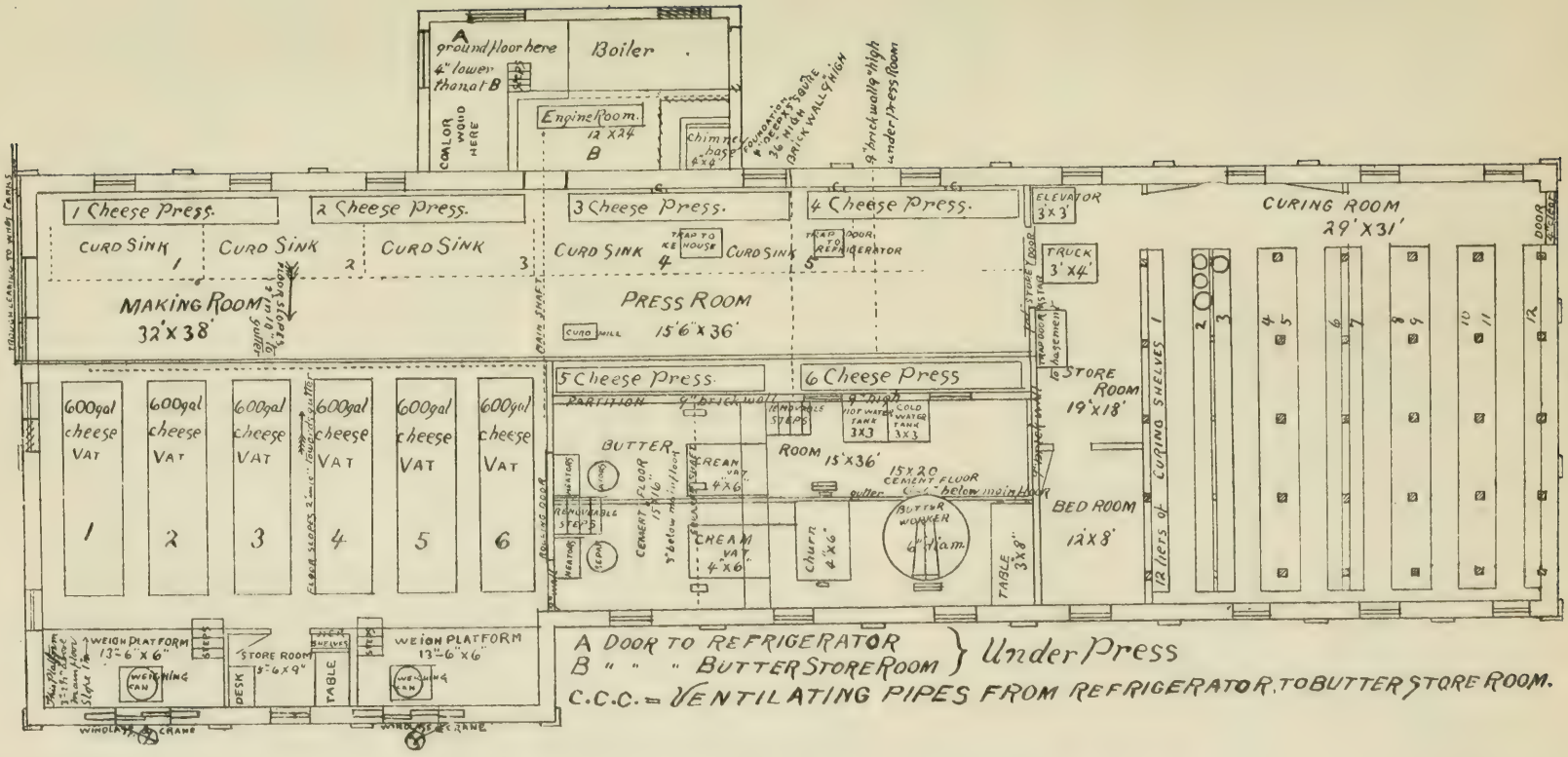
For details, see plans and specifications of the Norwich Junction factory, which may be modified to suit special circumstances. Also see other plans which are given. In any case secure a building suitable for the purposes intended, and one that will be convenient, cool in summer and warm in winter.



NORWICH JUNCTION CHEESE AND BUTTER FACTORY—Side Elevation.



NORWICH JUNCTION CHEESE AND BUTTER FACTORY—Foundation and End Elevation.



A DOOR TO REFRIGERATOR } Under Press
B " " " BUTTER STORE ROOM }
C.C.C. = VENTILATING PIPES FROM REFRIGERATOR TO BUTTER STORE ROOM.

NORWICH JUNCTION CHEESE AND BUTTER FACTORY—GROUND PLAN.

The walls outside, may be made of brick or stone, and inside of lath and plaster, or of one thickness of inch lumber nailed horizontally, on which building paper should be laid, and finish with matched lumber tongued and grooved. Where brick, terra-cotta or stone are not convenient, the outside walls may be made by nailing inch lumber on the studding, then building paper, and finish with boards and battens (dressed), the whole to be neatly painted white, with brown or some dark colour around doors, windows and cornice. The floors of the make rooms should be of 1½-inch red pine, tongued and grooved, laid in white lead, and finished with two coats of hot oil. They should have suitable slants to gutters, for convenience in cleaning. The floor of the cheese-curing room should be double, with paper between, matched lumber on top of paper. The store-room floors for butter may be of cement (domestic cement will make a good floor), hard earth, or an ordinary floor.

Provision should be made for ventilating all parts of the building.

SPECIFICATIONS OF NORWICH JUNCTION CHEESE AND BUTTER MANUFACTURING CO.

The following is the principal part of the specifications of material to be used and work to be done in the erection of a cheese and butter factory for the use of the Norwich Junction Cheese and Butter Manufacturing Company:

Excavations and Drainage. That part of the building which has a basement to be excavated to a depth of about four feet below average surface of ground on which factory is to be built. About twenty-seven cubic yards of earth shall be used to raise that part where separators and cream vats stand to a height of about three feet above average surface.

That part of engine room marked "B" in plans shall be filled to a level with main floor of making room, requiring about 16 cubic yards.

The balance of earth excavated and not required for filling in against walls shall be used in building elevated roadway and approaches to delivery platform.

Trenches shall be dug where and as deep as required for the walls to rest on firm sub-soil, and be safe beyond the reach of frost.

An excavation five feet square and four feet deep shall be made for foundation of chimney to boiler, and all footings of butments shall be excavated for, so that they shall rest on firm sub-soil.

A drain which shall average two feet deep, and laid with 4 in. tile, shall run lengthwise through centre of basement, beginning at the north end of the factory, and running with an even slope to the south until within the south wall; thence to curve and run easterly to the railway culvert. The part of drain running easterly shall be laid with 5 in. tiles.

A drain of 4 in. tiles shall be laid about a foot outside of foundation on either side, and parallel with central drain, and shall form a junction with the 5 in. drain. These drains shall be laid at least one foot below basement floor.

Foundations. Foundations shall all be put below frost and on firm sub-soil.

All outside foundation walls shall be 18 in. thick, and well built of broken stone, and well laid in good mortar.

The walls on west, south, and east sides of basement curing-room (making a total of 114 ft. lineal) shall be 9 ft. high above basement floor. The east wall shall be continued 36 ft. further north to the making-room to the full height of 9 ft., thence it shall be laid well below frost around to north-west corner of curing-room (200 ft.), which makes a total of 314 ft. lineal around main part of building.

The foundation of the three sides of engine room shall be laid below frost.

The foundations for chimney shall be built of stone, 5 ft. square at base, and taper in 4 ft. of height to 4 ft. square, which is the size of chimney base where the brick shaft begins.

All inside basement walls and partition wall in engine room shall be built of good hard arch brick 9 in. thick. Twelve butments (13 in. square, with 30 in. square footings shall be built under making room.

Fifteen 24 in. square footings, tapering up to about 18 in. square, about 18 in. high (6 in. of which shall be above cement floor), shall be built under curing room, and one 24 in. square footing shall be built in centre of room marked "I" in foundation plan.

Four in. by 18 in. buttresses shall be built.

Brick Work. The brick work shall be 9 in. (or length of one brick) thick, with 4 in. buttresses 18 in. over, and carried up 12 ft. high above stonework. Every fifth course shall be headers.

Only good red face brick to be used in face of wall, and all bricks to be well and evenly laid, and well bedded in good mortar, care to be taken to keep all joints well filled. There shall be no soft or unsuitable brick placed in face of wall, and sufficient care shall be taken to secure a substantial, neat, and workman-like job.

All doors and window frames, lintels, bond timbers, and other wood work, shall be set and bedded as directed by carpenters or other authorized persons, special care being taken to exclude air at junction of brick work and jambs.

Chimneys. Special care shall be taken to ensure a good and safe chimney to curing-room, which shall be lined with 8 in. smooth hard tiles. It shall extend downwards 4 ft. below ceiling of curing room, and have an 8 in. thimble built in 2 ft. below ceiling. Beneath the thimble a suitable pocket for the accumulation of soot shall be built, with a suitable thimble and cap for cleaning out.

The large chimney from boiler shall be carried up, and be built in connection with main walls of factory, sufficient care being taken to ensure a safe and substantial structure, 36 ft. above foundation.

All arches over door and window frames shall be 9 in. deep, and done in thorough workmanlike manner, to ensure strength and durability.

Pointing and Plastering. All stonework shall be pointed and well trowelled to ensure hardness. No earth to be filled in against walls until they are thoroughly dry.

The basement walls shall be pointed and plastered smoothly on the inside as high as the earth is to come against the walls on the outside, with mortar well gauged with cement.

The balance of walls in the basement curing room to be smoothly plastered with good lime mortar, and well trowelled.

The making-room, press-room, butter-room and curing-room, and all other rooms shown in plans, shall be lathed and plastered from wainscot to ceiling, two coats good hard finish; the ceiling shall be of suitable wood, with felt paper between it and joists.

All stonework above ground shall be lined off in blockwork on the outside, as shown in elevation plan.

Cement Floors. Basement floor and floors in butter-room and store-rooms to be made of good cement laid on broken stone and brick-bats, and to be thick enough (2 in.) to ensure durability.

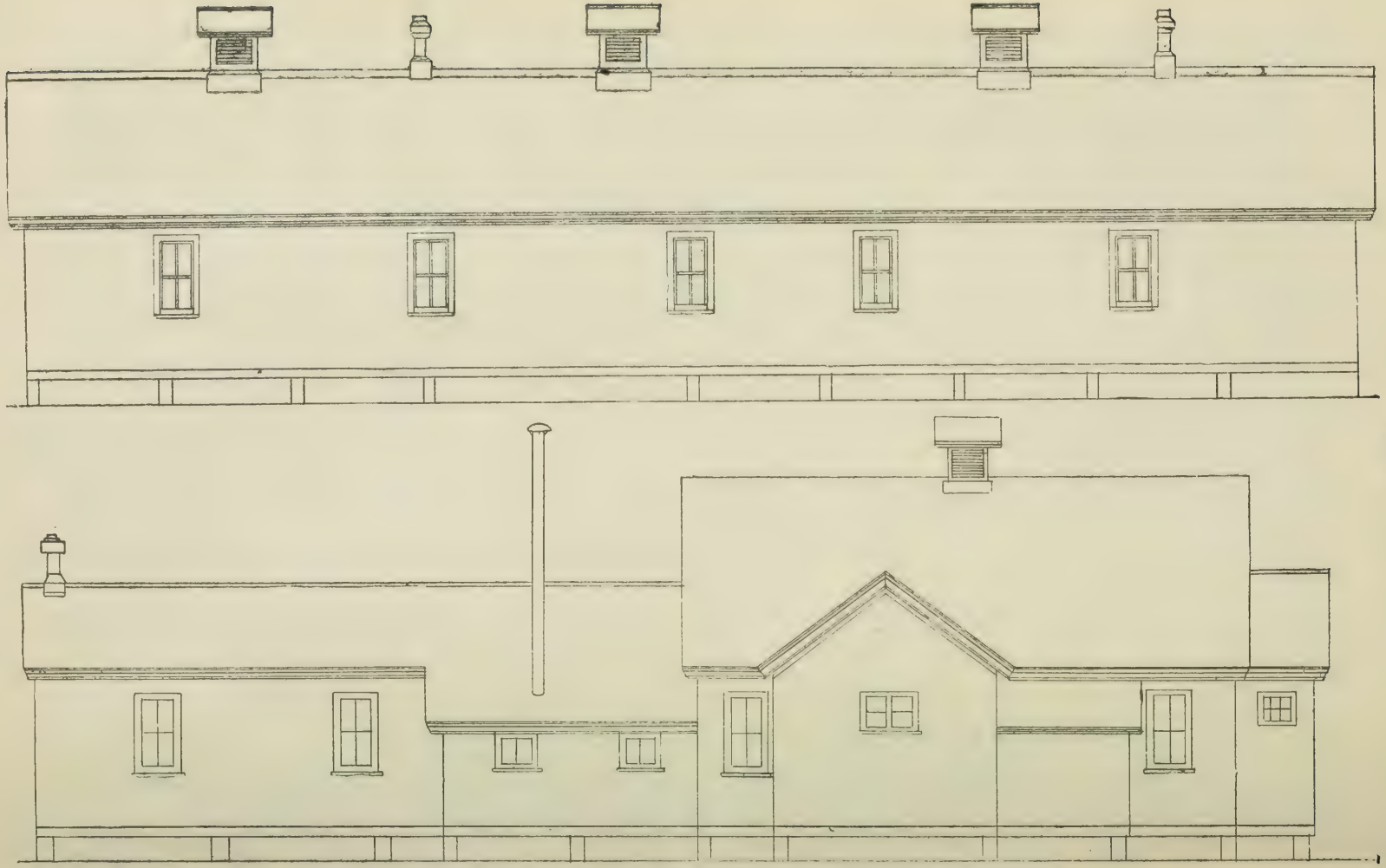
The surface in butter-room must be very smooth and slope to a gutter made in the cement. The cement gutter to run across storage-room out through wall on east side of factory.

Carpenter Work. All material shall be well suited to the special requirements for which it is used. No unsound or poor timber, lumber, or other material to be used as a permanent part of the building.

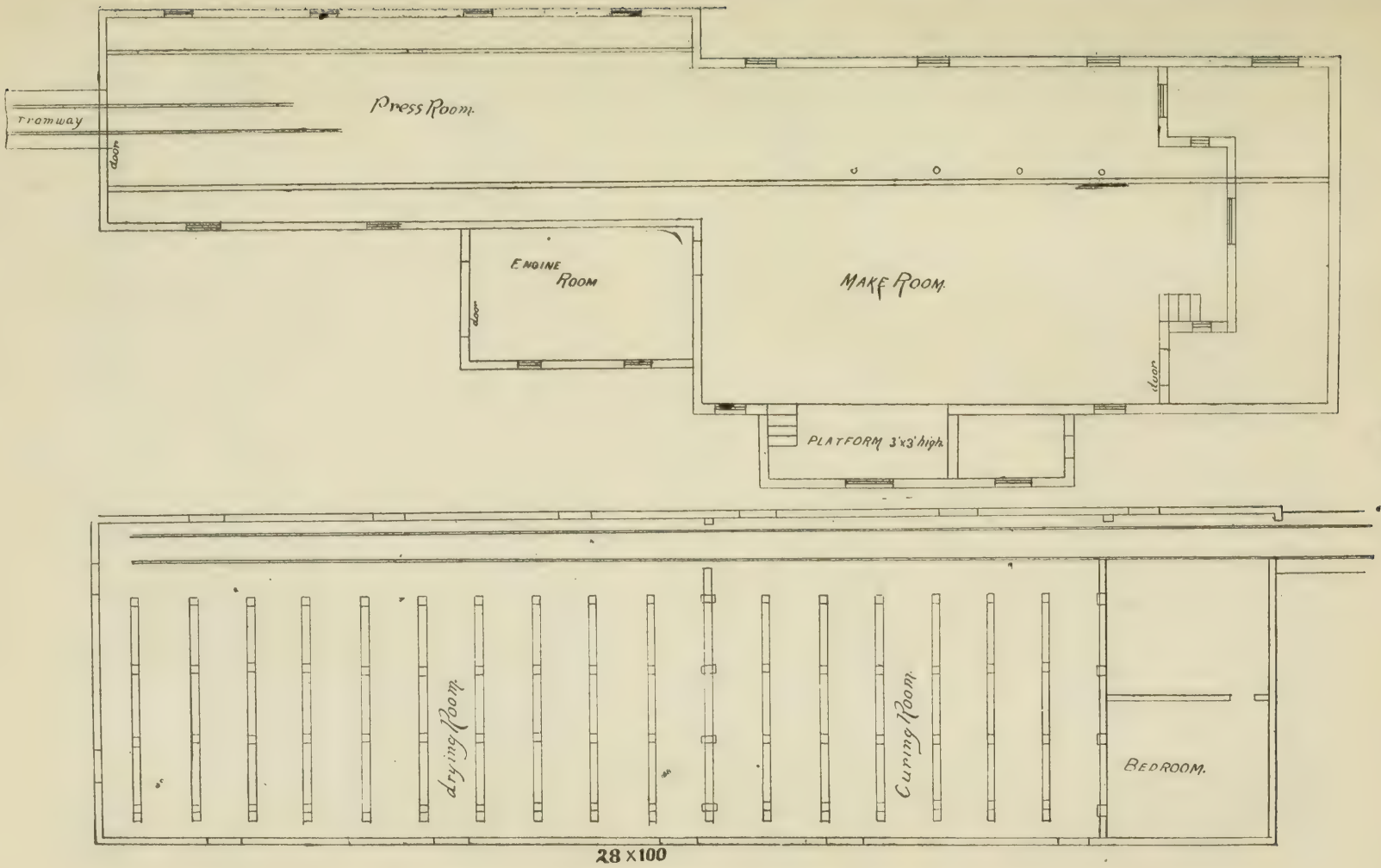
Girders and joists to be of sound green pine or white oak for first floor. Girders to be 10x12 in. under making-room, and 8x10 in. under curing-room and press-room. All joists under first floor 2x12 in.

Joists for ceiling shall be of pine 2x10 in., strongly spliced in centre and supported, as shown in margin, by nailing a pine or ash board of good quality 1x12 in. to the rafters at their junction at ridge of roof and across splice of ceiling joists as shown, and the rafters shall be 2x8 in. of pine, and well collar tied.

Ceiling joists and rafters shall be placed two feet apart between centres, and first floor joists shall be 12 in. apart; and the 10x12 in. girders on which they rest underneath making-room may be in two pieces, with a splice under gutter, and supported by a butment; joists to be graded so that the floor shall have a slope of two inches in ten feet towards gutter as shown in plans. All joists to be well bridged. Suitable stripping shall be nailed to the under side of ceiling joists for lathing to, unless the directors decide to ceil with wood.



STRATHALLAN CHEESE FACTORY—Side Elevation.



STRATHALLAN CHEESE FACTORY—Ground Plan.

A rough board floor of pine or hemlock to be laid and nailed on ceiling joists to make a suitable store-room for cheese boxes, etc.

Wall plates to be 2x10 in., laid double and joints broken.

Floors. All flooring used in making-room, press-room and curing-room shall be of a suitable quality of red pine to ensure a good tight floor. The stuff shall be thoroughly seasoned or kiln dried 1½ in. dressed and matched, not more than 6 in. wide. The floor when laid to receive two good coats of linseed oil, applied hot. The top edge of floor joists to be painted or tarred.

Interior. The interior of all the walls in the making, press, butter and curing rooms shall be plastered with rough mortar, then strapped with 1½ in. strips, with tar paper between strips and plastered wall, then to be lathed and plastered as before mentioned. Four feet in height is to be wainscotted with thoroughly seasoned or kiln dried pine. The walls behind wainscott to be felted same as behind strapping, with dead air space between

Frames, etc. All door and window frames shall have 2 in. jambs of suitable material (pine or oak).

Windows. Two windows, two lights 12x18 in. shall be placed in foundation walls under making-room.

Eight 4-light 12x24 in. windows shall be placed in walls of basement curing-room, as shown in plans, and one window same size to be placed in wall for filling ice cellar.

Twenty-three 4-light 12x28 in. windows shall be placed as shown.

Two milk delivery windows, 8 lights 12x14 in. to be placed as shown, The frames and sash to be strong and well made, and firmly secured in wall. The jambs shall be wide enough for sash, which is to be in one piece, to slide in boxed case built to frame on inside of wall. These buildings to have heavy solid sub-sills shaped to fit circle of cans when dumped.

Five dormer windows, 4 lights 12x20 in., shall be placed as shown.

All sashes shall be fitted with some good, cheap lifts and locks, so that both top and bottom sash can be raised or lowered and firmly held at any point.

All frames to be made and so finished as to exclude air, and present a plain and neat appearance.

The windows to curing room to be fitted with plane battened shutters, hinged at top, to open outwards like an awning, and to be secured when open or shut with a suitable hook or other fastening.

The three windows to butter-room to be fitted with double sash.

One large and suitable window to be placed in wall of engine-room as shown.

Doors. The outer door to making-room to be a heavy panel door 4 ft. 6 in. wide in clear and well proportioned. Outer doors from curing-room to be 3 ft. 6 in. wide, otherwise same as above.

The inside door to small store-room shall be a panel door 2 ft. 8 in. by 6 ft. 8 in. and 1½ in. thick.

Double rolling battened doors to butter-room.

Singly rolling doors from press-room to store-room, and same between store and curing-rooms.

A panel door 2 ft. 8 in. by 6 ft. 8 in. to bed-room as shown.

Three battened doors to cold store-rooms as shown.

Ventilators. Ventilators shall be provided as shown in plans. Wooden pipes 12 in. square to run down through ceiling in curing-room, making-room and butter-room. Also a 12 in. square pipe to run down the floor to basement ceiling. A ventilation pipe 6x12 in. to run from ceiling to floor in each of the cold storage rooms as shown in plans.

Shelving, etc. Curing-room to be fitted with shelves as shown in plans. Shelves to be 1½ in. x 16 in. x 12 ft. pine, dressed on both sides. Posts, pine 5x5 in. (dressed) in upper story and basement, except those which support girders, which shall be of white oak 6x6 in., or pine 6x8 in. Feet of all posts in basement to be dipped in thick paint, or coal tar and gasoline.

Roofing. Roof to be of the best quality of galvanized shingles, except roof of shed over roadway, which may be tar, felt and gravel. Roof to be first-class in every particular.

Painting and Glazing. All outside woodwork which is exposed is to receive two good coats of best brown oxide paint and raw linseed oil, except sashes, which are to be painted well with best lead and oil.

All inside woodwork except floors and curing shelves and posts shall receive two good coats of suitable paint.

The windows shall be all well glazed with good quality common glass, except the 14 x14 in. lights to delivery windows, which shall be double thick glass.

Cornice and Eavetroughs. Projection of roof at gable and eaves to be 16 in., and to be plainly and neatly finished with matched pine, which shall be first painted, and then best galvanized eavetrough shall be put up and have sufficient leaders connected with drains to carry off all water from roofs.

Hanging and Fitting Doors. All doors shall be well fitted to close tightly. Good hinges and locks to be used on outside doors, and good rollers used on the outside doors.

Trusses. The ceiling joists over delivery platform shall be supported across the spans by trusses above.

Stairs. Suitable stairs shall be provided where needed as shown in plans.

Intent and Meaning. The whole of the work to be done according to the true intent and meaning of the plans and specifications, and to finish and construct everything in a proper and workmanlike manner, notwithstanding every item or detail may not be particularly mentioned.

Shed over Driveway. The shed over driveway shall be as follows: A stone wall resting on firm sub-soil shall be built to support elevated earth driveway. On the wall planks for studding to rest on shall be laid and secured by bolts built in wall.

A light but sufficiently strong frame work shall rest on wall made of suitable posts 6x6 in., and girted to receive upright planed and battened boards. The rafters shall be secured to brick wall of main part and be sufficiently strong to carry gravel roof. Suitable double doors shall be firmly hinged as shown in plans.

Plan of Ayton Creamery.

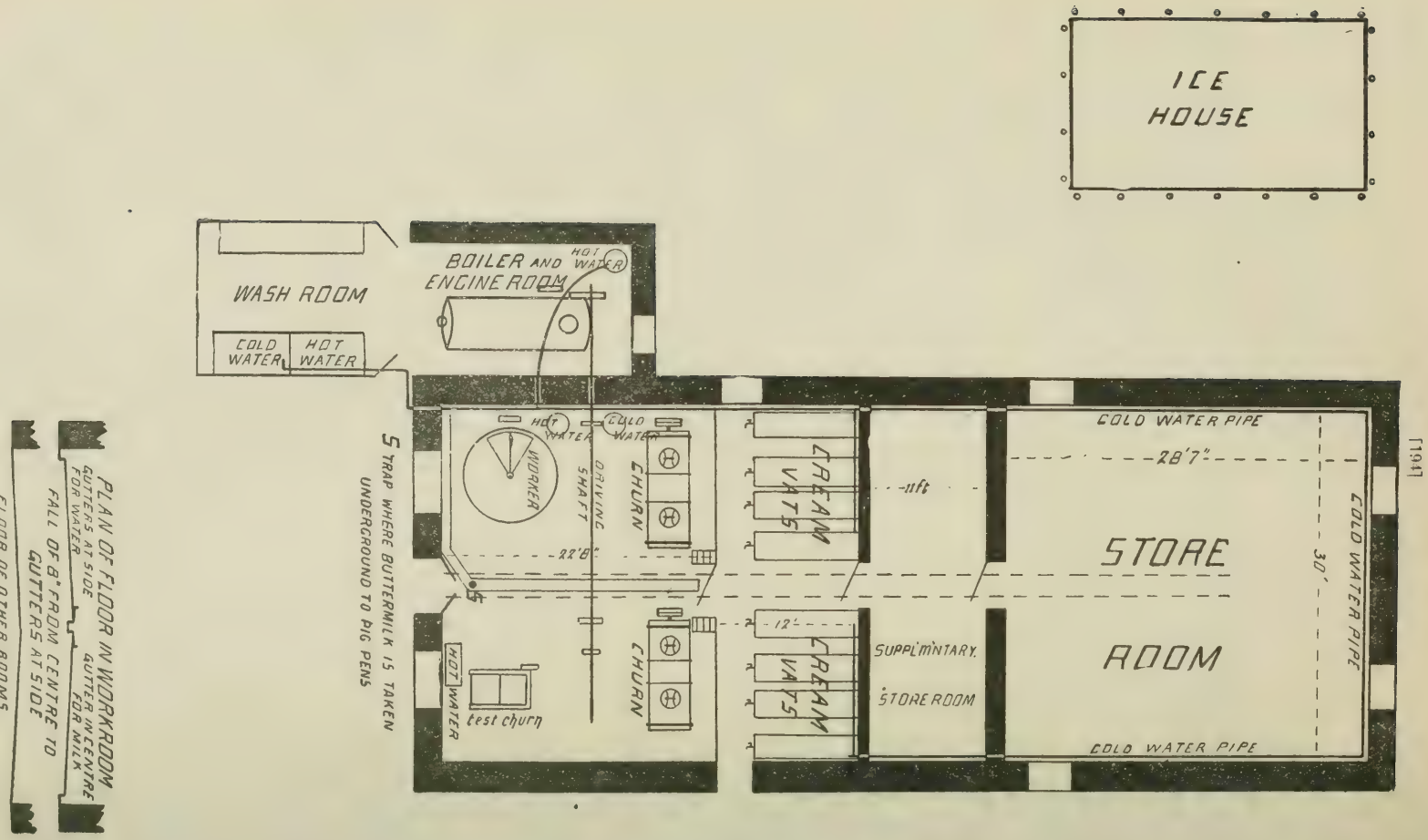
Through the kindness of Mr. A. Wenger, of Ayton, we are able to present a plan of this excellent creamery. The front or north side is on level with ground. The south end is possibly 6 ft. under ground, which gradually slopes to the front. Cream vats are raised on trestle-work, about 4 feet from the floor, so that the cream flows into the churns. The store-rooms are cooled with cold water. There is a large pan made of galvanized iron which should cover the whole size of the storage-room. This pan is 12 inches deep and the bottom bends down between the joists. Under the apexes of the pan are small wooden troughs which carry away the drip into a trough leading into the gutter. Three pipes ($\frac{1}{2}$ in.) run from the main pipe and empty into the pan. When the pan becomes full the water passes out in an overflow pipe into the gutter. This keeps the storage room at about 55° to 56° during summer. Occasionally it may rise to 58°.

Walls are of stone two feet thick. Ceilings plastered, except where cold water pan is. Floor in cream-room and work-room is maple, well oiled. Storage-rooms, cement floors.

Back of creamery there is a hill of considerable size. A spring rises out of this hill, which supplies water to all points where it is wanted.

Cost of Constructing Buildings.

The contract price for building the Norwich Junction cheese and butter factory was $4,095. A factory similar to the Strathallan cheese factory can be erected for from $3,000 to $3,700, according to material used. Buildings for a creamery on the Ayton plan would cost about $1,600.



AYTON CREAMERY—Ground Plan.

Changing Cheese Factories into Winter Creameries.

Instead of closing the cheese factory as soon as cold weather commences, a number of the leading factories are being equipped with utensils for the manufacture of butter in winter. The plan which appears to give most satisfaction is that of separating at the factory and returning the skim milk to the patrons. Where a number of small factories are near each other it would be advisable to put a separator in two or three factories and ship or haul the cream to a central factory, which might be equipped with both separator and butter-making apparatus. This plan would lessen expenses and save labor, as but one factory would need to go to the expense of churns, etc., while the milk would not have to be carried such long distances.

To give an idea of the cost of converting a cheese factory into a creamery for the winter, I have much pleasure in quoting from a couple of letters received from parties who have been engaged in such work this season.

The first is from a letter received from Mr. Ogden Hinch, who owns a factory near Napanee, in Eastern Ontario :

"Dear Sir,—Replying to yours of 23rd instant, *re* conversion of cheese factory into creamery, I utilized one of the receiving vats used in the cheese factory, and which we elevated about 3 ft. 6 in., and underneath which we placed one of the pans out of another vat, to receive the skimmed milk. The balance of the apparatus had to be entirely new, consisting of one No. 1 Alexandra separator, $400 ; two cream vats, $75 ; one, power butter-worker, $70 ; one trunk-lid churn, $60, (300 gal. capacity) ; one 15-horse power boiler and 10-horse power engine, $500 ; setting the same, $50 ; shaftings, pulleys and belting, $150 ; butter-ladles, packers, etc., $3 ; one 24-bottle Babcock tester, $22 ; cream pails, $2.50 ; one Newton's computator, $6 ; two skimmed-milk tanks, with plate glass sections running from top to bottom, costing $7 each ; steam ejectors, $15 ; rubber hose, $6 ; steam piping, taps and fitting, $15.

"As to the extra fitting to keep the building warm, my building was almost new, and being well-built, having matched lumber inside and outside, with building paper between, it was almost frost-proof, so that with the addition of double windows and doors, and a coal stove in the making-room, my building is very complete and comfortable. I also had doors put up in the shed where the teams stood, and had to enlarge my boiler-house and line it with felt paper and matched lumber, costing about $35, in all about $1,450. The cost of the creamery has been very much enhanced in my case, as it was an entirely new venture in this section."

It will be noticed that Mr. Hinch has an item of $500 for boiler and engine, which expense most factories could save by utilizing the factory boiler and engine.

The second is from W. S. Campbell, Secretary of the North Brant Cheese and Butter Co., Brantford :

"Dear Sir,—No two cheese factories would cost alike to change into butter factories. Our engine room was too small at first. It cost us $100 to enlarge it and board around underneath, to make our factory warm enough, and about $750 for separator, vats, shafting, belts, hangers, etc., and perhaps $50 more for many small articles and utensils. The following is a list : One 3,000 lb. per hour Alexandra separator ; one trunk-lid churn (400 gals.) ; one tempering vat ; one small vat ; one pump for elevating milk ; one twin cream vat (400 gals.) ; one 300-gallon buttermilk vat ; one 300-gallon skimmed milk vat. It took a lot of extra shafting, hangers, belting, etc., for all of which we contracted to pay a firm $720. We use one of our cheese vats to receive the milk. I should say that it would cost from six to eight hundred dollars to fit up, or change from cheese to butter factory, but would certainly advise building a separate room in which to make butter. There is a lot of work changing from one to the other each season."

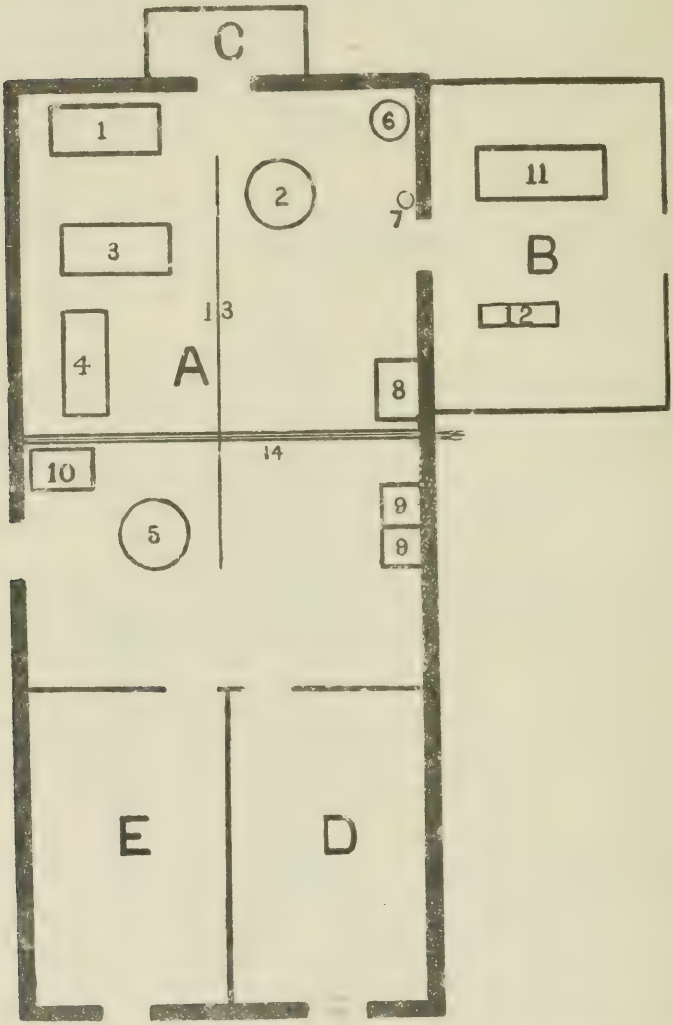
I wish to call attention to the fact that Mr. Campbell advises a *separate* room for the manufacture of butter, and this is being erected by some factory owners. A building 20x30, convenient and warm, would answer the purpose.

List and Approximate Cost of Utensils for Cheese Factories and Creameries.

A leading firm supplied us with the approximate cost of utensils for cheese factories and creameries as follows. They say in all cases, "these figures are only approximate, and can be modified in many ways, and reduced according to location and circumstances."

PLAN OF A CENTRIFUGAL CREAMERY.

Capacity, 500 Cows.

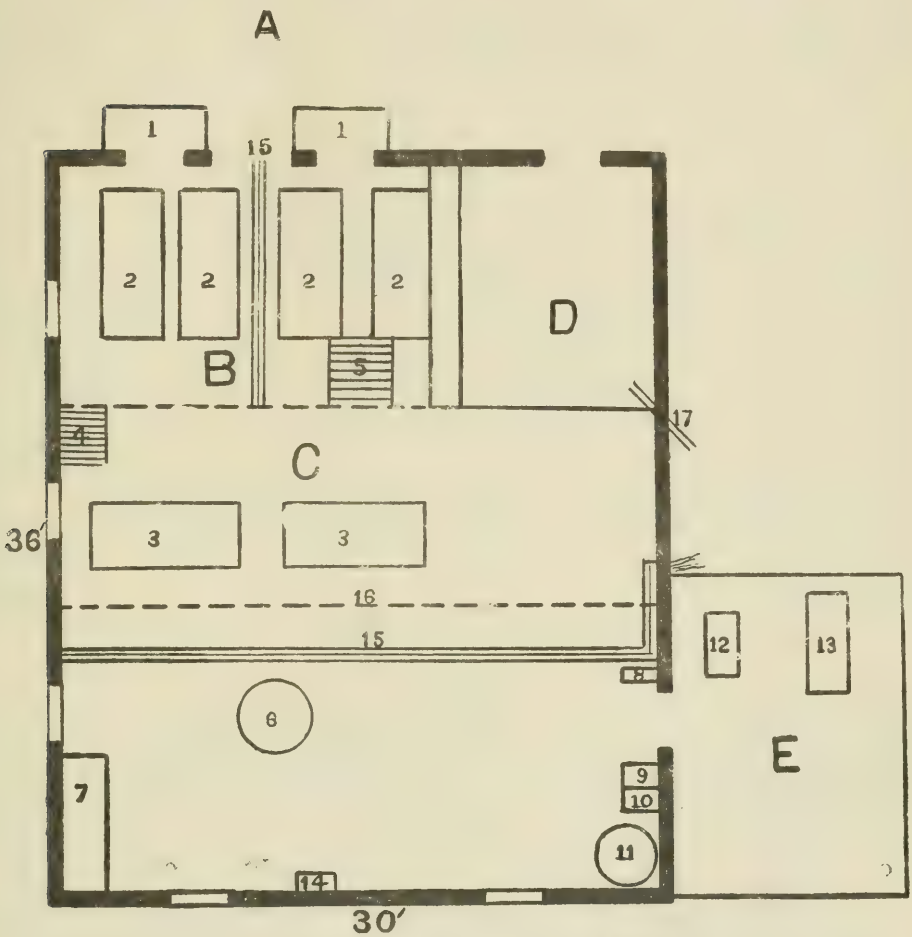


A. Working room, 26 x 30.
B. Boiler-room, 12 x 16.
C. Weighing platform, 4 x 8.
D. Ice house, 10 x 16.
E. Store room, 10 x 16.

1. Receiving vat (elevated 3 ft., or by using pump it may sit on floor).
2. Separator.
3. Cream vat.
4. Churn.
5. Worker.
6. Water tank overhead.
7. Babcock tester.
8. Skim milk tank (elevated).
9. Cold and hot water boxes.
10. Buttermilk tank.
11. Boiler.
12. Engine.
13. Line of shafting.
14. Gutter.

PLAN OF CREAMERY ON CREAM GATHERING PRINCIPLE.

Capacity, 500 to 700 Cows.



A. Covered drive way.
B. Cream platform raised 3 ft.
C. Churning floor.
D. Ice house.
E. Engine and boiler room.

1. Platform for delivery can.
2. Cream vats.
3. Churn.
4. Steps to platform.
5. Steps to storeroom underneath.
6. Worker.
7. Salt table.
8. Oil test churn.
9. Hot water.
10. Cold water.
11. Cold water tank elevated.
12. Engine.
13. Boiler.
14. Desk.
15. Gutter.
16. Line of shafting.
17. Drain from ice house.

Floors in B to slant one inch to gutter, in C to slant two inches to gutter.

Cheese Factory Outfit for 500 Cows, Exclusive of Buildings.

1 boiler and engine	$300 00	Curd scoop, dipper, pails, thermometers, etc	$4 00
2 600-gallon vats	120 00	1 24-bottle Babcock tester	20 00
1 12-hoop Fraser gang press	85 00	1 curd mill	20 00
1 6-gang upright press	60 00	Steam pipes, shafting, pulleys, hangers, etc	50 00
1 14-foot curd sink	25 00		
1 800-lb. scale, double beam	20 00		
1 50-gallon weigh can	10 00		
Milk conductor, head and pipe	4 00		$730 00
2 Curd knives	12 00		

Sundries.

1 hoisting crane	$11 00	Stencils, brush, etc	$2 00
1 small pair of scales	10 00	1 cheese trier	1 50
1 8-oz. graduating glass	75	1 water tank, 10-bbl	9 00
1 10-oz. graduating glass	1 00	1 water barrel	....
2 rakes for stirring	1 00	1 whey tank, 55-bbl. cap	20 00
1 bandager	2 00	1 pump for whey	10 00
2 floor brushes	1 50		
1 rubber scraper	50		$70 25

Outfit for a Creamery on the Separator Plan for 500 Cows (Exclusive of Buildings).

1 boiler and engine	$300 00	1 24-bottle Babcock tester	$20 00
1 Alexandra separator	400 00	Dippers, pails and thermometers	5 00
2 300-gal. cream vats	100 00	Butter-ladle and packer	2 00
1 400-gal. churn and worker	120 00	1 tempering vat or heater	20 00
1 400-gal. receiving vat	50 00	Shafting, bolts, and pulleys	75 00
1 800-lb. scale	20 00	1 240 lb. scale	10 00
1 50-gal. weigh can	10 00		
1 conductor, head, and pipe	5 00		$1,137 00

Sundries.

Strainers for cream vat	$1 00	1 scraper	$ 50
1 hair sieve	1 00	1 water tank, 20 bbls. capacity (hot)	13 00
1 butter printer	1 50	1 cold water tank	....
1 8-oz. graduated measuring glass, for color	75	1 skim-milk pump or ejector	10 00
Stencil plates and brushes	2 00	1 tank (6,000 lb. capacity)	10 00
1 butter trier	3 50		
2 floor brushes	1 50		$44 75

Cream-gathering Outfit for a Creamery of 500 Cows (Exclusive of Buildings).

1 boiler and engine	$300 00	5 Drivers' cases	$12 00
2 300-gal. cream vats	100 00	Pails, ladles, packers, etc	5 00
1 300-gal. churn and butter worker	100 00	Shafting, pulleys, belts, etc	50 00
1 800-lb. scale	20 00	Sundries (pails, dippers, etc.)	10 00
10 Curtis refrigerator carrying cans	100 00	1 50-gal. weigh can	10 00
1 240-lb. butter scale	10 00		
1 No. 2 oil test churn (Curtis)	60 00		$777 00

Sundries.

1 cream conductor	$4 00	1 butter trier	$3 50
1 strainer for cream vat and churn	1 00	Water tank (20 bbls. capacity)	13 00
1 hair sieve for buttermilk	75	1 cold water tank (20 bbls. capacity)	....
1 butter printer	1 50	1 hot water tank	....
1 8-oz. graduating glass	75	1 buttermilk tank	....
Stencils, plates, and brush for branding	2 00	Steam and water pipes	....

OUTFIT FOR CHEESE FACTORY AND CREAMERY COMBINED, WITH SEPARATOR FOR 500 COWS (EXCLUSIVE OF BUILDINGS).

1 boiler and engine	$300 00	2 600-gal. cheese vats	$120 00
1 Alexandra separator	400 00	1 Fraser gang press	85 00
1 400-gal. receiving vat	50 00	6-gang upright press	60 00
2 300-gal. cream vats	100 00	1 14 ft. curd sink	25 00
1 400-gal. churn and worker	120 00	2 curd knives	12 00
1 800-lb. scale	20 00	Curd scoops, pails, etc	5 00
1 50-gal. weigh can	10 00	Curd mill	20 00
1 conductor, head, and pipe	5 00	Shafting and pulleys	75 00
1 24-bottle Babcock tester	20 00	1 240-lb. butter scale	10 00
Dippers, mops, thermometers, etc	5 00		
Butter-ladles, pails, and packers	5 00		$1,467 00
1 sep. temp. vat	20 00		

(See sundries for cheese factory and creamery on separator plan.)

OUTFIT FOR COMBINED CHEESE AND BUTTER FACTORY ON CREAM GATHERING PLAN FOR 500 COWS (EXCLUSIVE OF BUILDINGS).

1 boiler and engine	$300 00	1 conductor, head, and pipe	$5 00
2 300-gal. cream vats	100 00	1 24-bottle Babcock tester	20 00
1 400-gal. churn and butter worker	120 00	2 600-gal. cheese vats	120 00
1 800-lb. scale, double beam	20 00	1 Fraser gang press	85 00
1 240-lb. butter scale	10 00	1 6-gang upright press	60 00
10 Curtis refrigerator carrying cans	100 00	21 by 14 ft. curd sink	25 00
1 No. 2 Curtis oil test churn	60 00	2 curd knives	12 00
5 Drivers' cases	12 00	Curd mill	20 00
Pails, ladles, packers, etc	5 00	Curd scoops, pails, etc	5 00
Shafting, pulleys, belts, etc	50 00		
1 50-gal. weigh can	10 00		$1,139 00

(See sundries for cheese and butter on cream gathering plan).

DAIRY STOCK.

At present our stock numbers 18 milking cows, composed of three imported Ayrshires and one Canadian bred; one imported Guernsey and three Canadian bred; one Jersey; three Holsteins; and the rest grades. There are also seven calves and yearlings—1 Jersey, 1 Guernsey, 2 Ayrshires, 1 Holstein and 2 grades—all heifers except the Guernsey. A horse and seven pigs complete the list. The following cattle have been sold during the year: 4 grade calves, 2 grade cows, 1 Ayrshire cow, 1 Ayrshire bull calf and 2 heifer calves; 2 Holstein bull calves.

We are indebted to the Farm department for about 150 tons of corn ensilage, 1,300 bushels of turnips, 2½ acres of fodder, 15 acres of pasture, straw for bedding for which they receive the manure, and miscellaneous help at different times.

The rest of the food used by the department was purchased with the money granted by the Legislature for that purpose. The increase of our stock for the coming year will necessitate provision for a larger quantity of feed—nearly double that of other years—as our stock will be doubled.

During the year we have weighed the milk from each cow morning and evening. Samples have been taken from each cow's milk two days in the week. We are thus able to tell what each cow has been doing for us during the year. Our standard, and the standard which I would urge upon every owner of cows to adopt, is 6,000 pounds of milk in a year or 250 pounds of butter. A standard is a limit below which no cow should go. Too many have set their standard at 3,000 pounds, and a cow seldom does any more than you expect of her. The owners of cows have adopted a 3,000 lb. standard and the cows think, "If that is all that is expected of us, why we will not disappoint our owners. That would be ungrateful." Dairymen, double your standards and you will soon see the cows begin to double theirs! Those that do not, let the butcher beef them.

Test the Cows.

Breeders of pure-bred dairy stock should test their cows. Some time ago I visited a somewhat noted herd of pure-bred cattle with the intention of buying one or two of the cows if the prices and animals were suitable. Although I have made a study of the points of a dairy cow, I would rather have her record than all the "points" a cow could carry. My belief in the importance of a record over form is strengthened by the fact that in our own stable we have two cows standing side by side, one of which (a blue "scrub") shows all the points that any one could desire, while her companion is a tidy, neat, fat red cow that has the beef form to a large extent. The record of the old blue cow last year was 9,028 pounds of milk containing an average per cent. of fat of 3.86, or a total of 348.5 lb. of fat for the year, which would be about 380 lb. of butter. The tidy red cow gave 8,798 lb. of milk, with 3.73 per cent. of fat, or 328 lb. of fat for the year.

I cite these facts to show how easily one might be deceived in judging cows from appearance only. Having looked these pure-bred cows over, I asked the person in charge if they kept a record of the quantity and quality of the milk produced by the cows, which, I judged, were the best in the herd. "No," he said, "we do not keep any record, except that in a general way we note how much milk each cow gives."

This matter of weighing milk and of testing it for quality is so important that I wonder that more of our breeders of pure-bred dairy stock have not practiced it in the past. What a great advantage it would be if a breeder could say to a buyer: "This cow gave so many pounds of milk last year, containing a certain per cent. of fat," and what additional value would be given to young stock or male animals if the owner could point to an excellent record of the dam. I think I am quite safe in saying that it would mean many dollars to the breeders of first-class dairy stock. What care I if the animal that I thought of purchasing traced its pedigree back to famous ancestry if the individual itself is a poor performer? Individuality, quality and performance are what we require in all animals for the dairy, and these points can only be determined by placing each animal on its own merits. Buying cows without knowing what they have done at the pail is like buying a pig in a bag—you never know what you have until you open the bag.

Breeders of common stock should test their cows. I fancy I hear some one say "It is all right for the Model Farm or breeders of fancy prize animals to test their cows, but it will never pay an ordinary farmer to do so." Are you sure of that? No one who keeps cows can afford to neglect to test them, using for that purpose one or other of the methods in vogue. You need not go so fully into every detail, but you should keep one kind of a record. How many cows there are which do not give enough milk to pay for their keep! Taking an average herd of cows, I think I should be quite within bounds in saying that one-quarter of them are non-paying, and require to draw from the other three-quarters that do pay for one-half of the cost of their own maintenance and care.

Better keep only five good cows than five good ones and five poor ones, or than ten poor ones. Why? Because the five poor ones reduce the profits on the five good ones, and the ten poor ones are a continual source of loss. It takes just about as much to maintain a poor cow as a good one, sometimes more; but the latter gives a profit from the food fed, whereas the former is fed at a loss. It takes about two-thirds of what we feed to a cow to keep the body alive, while the milk, butter and cheese that we get from her comes from the other third. I am satisfied that nothing that can be done would prove of more value to the dairy industry of the province than the weighing and testing of the milk from the individual cows of the herd. At the end of one or two years there would be a glut of cow beef in the market.

How to Keep a Record.

I shall first give an outline of our methods, and then suggest some modifications suitable for ordinary farm practice.

In the stable, just above the scales is tacked a sheet ruled and headed in the following manner:

Date.	No. 1.		Artis.		Rose.		No. 13.	
June.	M.	E.	M.	E.	M.	E.	M.	E.
13	20	23	31	27	18	17	19	18
14	20	20	30	31	17	17	18	18
15	20	19½	30	29	18	19	18	19
16	18	23½	30½	29½	17	17	18	21
17	19	19½	28½	30½	18	19	19	19½
18	20	22	32	29	18	18	19	19
19	21½	20	30	29½	18	18	19	19
Total lb. for week	138	147	212	205	124	125	130	133½

The above is the record of the quantity of milk given by four of our cows during the week ending June 19th. Each sheet records the milkings for two weeks. Twice a week, morning and evening, samples are taken from each cow for testing with the Babcock tester. The record of each week is then entered in a book kept for that purpose. This book is ruled, and has the following headings for each cow:

Record of Rose.

Week ending	a.m.		p.m.		Total lb. milk.	Average % fat.	Remarks.
	lb. milk.	% fat.	lb. milk.	% fat.			
June 19	124	5.2	125	4.9	240	5.05	Heifer calf March 31st. Served June 24th.

The average per cent. of fat for the same week of the other three cows mentioned was: No. 1, 4.82; Artis, 3.20; and No. 13, 3.22.

At the end of the year each cow's record is before us; and that our many visitors may see at a glance what the performance of the respective animals has been during the previous year, we put a neatly printed card in front of each cow's stall recording their success or otherwise. This card contains data as follows:

Name..... Breed.....
Age..... Record for year ending..... 189 ....

Total lb. milk given in the year.....
Total number days milking.....
Average lbs. milk per day.....
Highest percentage fat .....
Lowest " " .....
Average " " .....
Total lb. butter-fat.....
Pounds milk producing one pound fat, or about one and one-tenth pounds butter.....

Now, to most dairymen, this may seem like too much trouble; but I can assure you that there is very little in this world that is worth getting that is obtained without some trouble, care and forethought. To the owner of cows who will take the necessary amount of care to test each of his cows, there will come a satisfaction second only to that which he experiences when he receives the dollars earned by his herd, and *knows* that it is paying good interest on the capital invested.

Record of Our Dairy Herd.

The record of our herd for the year 1892 is as follows:

Yearly record of Dairy Cows, ending December 18th, 1892.

Name of cow.	No. days milking	Calved.	Bred.	Total lb. milk.	Per cent of fat.			Total fat.	Lb. milk to 1 lb. fat.
					Highest	Lowest.	Average		
No. 1	280	1892 April 15	1892 June 28	7696	5.18	3.08	3.89	299.37	25.70
No. 2	329	1891 Jan. 13	1892 June 25	5413	6.20	3.63	4.38	237.09	22.83
No. 4	308	1891 Dec 20	1892 April 28	7788	4.72	3.62	3.91	311.51	25.00
No. 5	182	1892 June 16	1892 July 4	4827	5.20	3.17	3.85	185.84	25.95
Susie	259	1891 Dec. 18	1891 June 15	5451	4.25	3.03	3.42	186.42	29 19
Nellie	217	1892 April 16	1892 June 17	4848	5.20	3.10	3.49	169.20	28.65
Kassie	280	1892 May 19	1892 July 17	9913	3.29	2.32	2.82	279.55	35.4
Alvo	336	1892 Sept. 20	1892 Dec. 18	7956	4.32	2.50	3.16	250.61	31.75
Milne	343	1892 July 24	1892 Sept. 9	6765	4.92	2.90	3.92	265.18	25.51
Rose	259	1892 Mar. 31	1892 June 24	6299	5.92	3.77	5.18	323.14	19.49
Patience	273	1892 Mar. 2	1892 June 26	6275	6.35	3.58	4.59	288.02	21.78
Dairy Queen	325	Mar. 27	June 6	8845	4.70	2.76	3.78	334.34	23.46

Method Modified.

Weighing the Milk. To those who do not wish to weigh the milk every day, or to test it twice a week, I would submit a modification of the method previously given.

We will take two cows mentioned in the table given above and apply different methods for computing the amount of milk given during a certain period of time, and note how the results compare with weighings made every day. From May 30th to June 26th, No. 1 gave 1,128 lb. of milk, and Rose gave 928 lb. If we had weighed the milk of No. 1 on the 5th, 12th, 19th and 26th of June, multiplying each day's milk by seven, the amount she would have been credited with would be 1,106 lb., 22 lb. less than her actual yield. If it had been weighed on the 12th and 26th, and the daily yield in each case had been multiplied by 14 (days), she would have been credited with 1,134 lb., 6 more than her yield. If it had been weighed on the 26th only, to ascertain her probable yield for the four weeks previous, she would have been credited with 37 multiplied by 28, or 1,036 lb., 91 less than her yield.

By weighing Rose's milk once a week on the same date as No. 1, and calculating in the same manner, she would have been credited with 896 lb., her actual yield being 928 lb. Twice per month would give 1,038 lb. Once a month, on the 26th, 924 lb.

By weighing the milk once a week on the same day each week, and multiplying the weight by seven, fairly reliable data may be obtained; but for all the time and expense required (scales for weighing milk may be bought for five dollars), it would pay to weigh the milk every day.

Testing for Quality. For quick, accurate testing, there is nothing equal to the Babcock method. Every dairyman with ten or more cows ought to have one of these testers and know how to manipulate it. Other tests, such as the lactoscope, pioscope,

lactometer, cream gauge, lacto-butyrometer, etc., help to guess at the quality of milk; but other than the chemical analysis, there is nothing like the shorter methods of the Babcock and Beimling testers.

The average per cent. of fat for the four weeks, May 30th to June 26th, was 3.64 for No. 1, and 5.57 for Rose, the determinations being made four times each week. By giving their daily tests during this time, we shall be able to form some idea as to how far astray we should be if we tested only on one or more days during the period, and allowed that to be the representative test of the quality of their milk.

Date.	No. 1. Per cent. fat.		Rose. Per cent. fat.	
	p.m.	a.m.	p.m.	a.m.
May 30	4.3		6.5	
" 31		4.0		5.2
June 2	3.2		5.8	
" 3		2.2		—
" 6	3.6		6.0	
" 7		2.9		5.4
" 9	2.8		6.5	
" 10		—		5.2
" 13	4.5		4.4	
" 14		4.3		4.6
" 17	3.9		6.0	
" 18		4.6		5.2
" 21	3.7		6.6	
" 22		3.4		5.0
" 24	3.6		6.4	
" 25		3.6		5.2
Average	3.70	3.57	6.03	5.11

Looking at the daily tests, we find a considerable variation. In the case of No. 1, the morning milk varied from 4.3 per cent. on May 30th, to 2.8 per cent. on June 9th, and 4.5 per cent. on June 13th. The evening milk shows a still wider variation, from 2.2 to 4.6 per cent. Rose varied from 4.4 to 6.6 in the morning, and from 4.6 to 5.4 per cent. in her evening milk. This variation we find in all our cows; but by testing each cow at different intervals, say, once a week, or once in two weeks, or even once a month, owners would be able to arrive at a fair conclusion as to the quality of the milk produced by each cow. If every owner of cows would test them during the coming year to see how much milk and butter each cow produces, the results would surprise no one more than themselves.

INSTRUCTION AND EDUCATION.

From six to nine students are sent each week to the dairy to receive instruction in testing milk, setting and separating milk, handling cream and churning butter. With our increased facilities we are able to accommodate a class of 25 in the testing and butter departments. The same number may be accommodated with work in the cheese department. We shall thus be able to give our regular students a pretty thorough course in the practical part of dairying. I am much indebted to Mr. T. C. Rogers, our dairyman, for the great pains taken in giving the students these lessons, and for the tidy, orderly way in which the dairy is kept; also for the good quality of butter made during the year and the careful, painstaking manner in which he has conducted the various experiments.

Farmers' Institute and Special Dairy Meetings.

Besides attending a portion of the regular Institutes in January, and the annual meetings of the three Dairy Associations, I also attended a number of special institutes and

dairy meetings throughout the whole year. These have brought me into touch with outside dairy work and have been of great profit to myself. I trust they have also been profitable to those who attended these gatherings.

Short Dairy Course.

As intimated in my last report, provision has now been made for a short course in dairying in connection with this department. This announcement met with great favor from buyers, salesmen and makers. Before our special circulars had been distributed three weeks' applications sufficient to fill our accommodation were received, while a number (about 50) were unable to gain admission for lack of room. While it is perhaps too soon yet to speak of the success of this new step, yet I feel warranted in asking that a building and equipment be provided for 100 students. If those who are directly interested in this great industry ask for instruction and help I think it is our duty to provide such at the very lowest cost and in the best manner possible. We already have several applications for 1894 from those who have been disappointed for 1893.

The circular sent out to leading dairymen, secretaries, presidents, manufacturers, etc., of butter and cheese, throughout the province, appears in the report of the President.

EXPERIMENTAL WORK OF 1892.

FEEDING.

Early in the year we repeated the experiment of last year to see the effect of food on the quality of milk and butter. This is a question that is frequently discussed at farmers' institutes and dairy meetings generally. Can I feed fat, or cream, or butter into milk? is a question that numbers of dairymen are asking themselves, especially those who are supplying milk to a town or city and wish to gain a good reputation; and those who supply milk to a factory or creamery where it is paid for according to test or percentage of fat. Most feeders think they can, and view with distrust any one who preaches any other doctrine. One man during a conversation about this matter, said, "I wouldn't believe that milk could not be made richer by feeding high if ten professors said so." My own opinion, based on two years' experiments with six cows each year, is that while flavor, aroma, a nice taste, and all such things may be put into milk and butter with feed, and people delude themselves by thinking it is cream, yet from the same number of pounds of milk no more butter-fat will be obtained from the same cows, whether fed on a poor or a rich ration, for a period of, say, six weeks.

The results of the experiments for both years are found in Bulletin LXXX following:

Effect of Food on Milk and Butter.

During 1891 we conducted an experiment similar to the one here reported.

The cows used in the experiment were six in number, divided into three lots—two cows in each lot. The general plan was to feed each lot for four weeks on one ration, note the quantity and quality of the milk and butter, then change to another ration and feed for four weeks until each lot had been fed each ration for the same length of time. The rations were:

No. 1. Ensilage, 30 lb.; oat straw, 20 lb.; hay (cut), 10 lb.
No. 2. Hay (cut), 20 lb.; linseed oil meal, 4 lb.; cottonseed meal, 5 lb.
No. 3. Hay (cut), 20 lb.; pea meal, 4 lb.; oatmeal, 5 lb.; corn meal, 8 lb.

The effect on the fat and solids not fat was as follows:

The average per cent. of fat given in the milk by the three lots when fed on ration No. 1 was 3.67; on No. 2, 3.49; and on No. 3, 3.25.

The average per cent. of solids not fat from all the lots when fed on No. 1 was 7.79; on No. 2, 8.62; and on No. 3 it was 8.37.

In every case there was a slight decrease in per cent. of solids not fat when the cows were fed the poor ration.

Some conclusions from the experiment of 1891:

1. When there is a deficiency of fat or albuminoids in the ration, the animal draws from her own body to make up this lack, maintaining about the same *quality* of milk, though the quantity may be greatly reduced.

2. When an excess of nutrients is fed these are doubtless wasted to a considerable extent, and if fed for a length of time might do injury to the animals, though these cows ate their full ration for a period of 21 days without apparent injury.

3. Judging from the returns from the winter ration we may expect to receive profit from a much wider ratio and on less nutrients than the German standard calls for.

4. In answer to the question, Was the fat fed in the food recovered in the milk these experiments show that on ration No. 1 more fat was recovered in the milk than was fed in the food, and on Nos. 2 and 3 the returns of fat in milk were about the same as the fat fed, but whether it all came from the fat of the food or not was undecided.

5. The general conclusion would seem to be, that *the food does not affect the quality of milk to any appreciable extent so long as the animals are in good condition.* This applies more particularly to rations fed for short periods—from 21 to 28 days—but in the case of Lot III it may be said to be true for 49 days.

6. It is a waste of food to give more than the animal can assimilate. Find the capacity of the cow for economic production and feed to that capacity.

7. A poor ration may give profitable returns for a while, but will end in depletion of the cow's vitality and injure milk secretion.

8. The cost of food fed is an important item in the profitable returns from a dairy, and an extra amount of some cheap food in the ration, such as ensilage or bran may prove a profitable investment. For instance in the case of Lot I, by putting 20 lb. straw in the place of 6 lb. hay and 5 lb. bran, and reducing the ensilage from 50 lb. to 30 lb. per day, we reduced the cost of the weekly food from $1.78 to $1.22, but we also decreased the value of their production in butter-fat (besides loss of skim-milk) from $3.98 to $2.31; in other words by reducing the cost of the food 32 per cent., the value of fat was reduced 42 per cent., besides causing the cows to lose in weight. (For details of this experiment see College Report for 1891.)

Experiment of 1892. This experiment was conducted somewhat differently from that of last year. The number of cows was the same, but they were divided into two groups instead of three, and two rations only were used. The experiment lasted from April 4th to June 12th, a period of ten weeks. The cows used were H. No. 2, A. No. 3, and No. 13 in Lot I. A. No. 2, No. 4 and No. 2 comprised Lot II. The rations were: No. 1, 50 lb. ensilage, 1 lb. bran, 5 lb. hay (uncut). No. 2, 50 lb. ensilage, 5 lb. pea meal, 3 lb. oatmeal, 2 lb. barley meal, 5 lb. hay (uncut).

No. 1 ration cost 6.35 cents per day and No. 2, 15.83 cents.

Lot I was fed for five weeks on ration No. 1, then changed to ration No. 2, which was fed to them for five weeks. Lot II commenced on ration No. 2 and were then changed to ration No. 1. They were fed on each ration for five weeks. The milk from each cow was weighed morning and evening. The per cent. of fat, water and solids not fat in the milk of each cow was determined on four days of each week. On two days of each week the milk from each lot was set in the Cooley creamer. The skim milk was tested; the cream from each lot was churned separately; the butter-milk was tested; the quality of the butter was noted and a sample sent to the laboratory for analysis, determination of melting point and Iodine number. The cows were weighed at the beginning and close of each period of feeding.

Table showing effect on quality with lot I (3 cows):

Week ending—	Average p. c. fat.	Average p. c. solids not fat.	Average p. c. total solids.	Weekly lb. fat.	lb. butter in two days.	lb. milk for one lb. butter.	Ration.
April 17	3.50	8.90	12.40	21.21	5.0	23.0	No. 1.
" 24	3.34	8.71	12.05	20.74	6.1	25.2	
May 1	3.31	8.77	12.08	19.73	4.1	27.8	50 lb. ensilage; 5 lb. hay (uncut);
" 8	3.36	8.65	12.01	18.85	5.5	26.7	1 lb. bran.
Averages	3.38	8.76	12.14	20.13	5.2	25.7	
							No. 2.
May 22	3.10	8.85	11.95	20.00	.....	.....	
" 29	3.31	8.90	12.21	20.65	5.5	28.9	50 lb. ensilage; 5 lb. pea meal;
June 5	3.37	8.86	12.23	20.08	4.9	25.1	3 lb. oatmeal; 2 lb. barley
" 12	3.43	8.81	12.24	20.03	6.9	21.9	meal; 5 lb hay (uncut).
Averages	3.30	8.86	12.16	20.19	5.8	25.3	

Table showing effect on quality with lot II (3 cows):

Week ending—	Average p. c. fat.	Average p. c. solids not fat.	Average p. c. total solids.	Weekly lb. fat.	lb. butter in two days.	lb. milk for one lb. butter.	Ration.
							No. 2.
April 17	3.69	9.20	12.89	18.84	4.0	26.3	
" 24	3.63	9.20	12.83	18.36	5 6	23.9	50 lb. ensilage; 5 lb. pea meal;
May 1	3.65	9.29	12.94	17.54	5.3	24.3	3 lb. oatmeal; 2 lb. barley
" 8	3.65	9.12	12.77	17.42	5.4	25.7	meal; 5 lb. hay (uncut).
Averages	3.66	9.20	12.86	18.04	5.1	25.1	
							No. 1.
May 22	3.71	8.76	12.47	13.69	.....	.....	
" 29	3.81	8.89	12.70	11.66	2.9	24.8	50 lb. ensilage; 1 lb. bran; 5 lb.
June 5	4.00	8.20	12.20	11.48	3.6	24.7	hay.
" 12*	....	.....	.....	.....	.....	.....	
Averages	3.84	8.62	12.46	12.28	3.3	24.8	

*A. 2 was sick during the latter part of the third week of this period, and hence the results are not reported for the last week. The average per cent. of fat for this week from cow No. 2 was 4.30, and from No. 4 was 4.08. For the last week of period I. the average per cent. of fat from the same cows was respectively 3.67 and 3.77. The average per cent. of total solids from these two cows during the last week of period I, on the rich ration was 12.88, and during the second period on the poor ration, the average was 12.33.

Conclusions as to Quality.

1. The average of four weeks on a poor ration with Lot I was 3.38 per cent. of fat. With one week intervening, during which time they were changed to a rich ration containing the same amount of coarse fodder, but having 10 lb. meal in addition, the average per cent. of fat in the milk from the same cows for four weeks was 3.30—practically the same as in the previous period. Lot II gave milk containing 3.66 per cent. of fat during the period on which they were fed the meal ration, and 3.84 per cent. of fat while receiving practically no meal for three weeks. Again we must conclude that for a short period of time with these cows meal did not affect the per cent. of fat or quality of the milk to any great extent.

2. Last year the poor ration gave results which showed a slight decrease in per cent. of solids not fat. The same is true for this year. The average of both lots is 8.69 per cent. on the poor ration and 9.03 on the meal ration.

Table showing effect on quantity :

Date.	Total lb. of milk given.	+Gain or —loss.	Weight of cows at beginning of period.	Weight of cows at close of period.	+Gain or —loss.	Ration.
Lot I.						
April 11—May 8..	2,384	.....	3,265	3,068	—197	Ensilage and hay.
May 16—June 12..	2,450	+66	3,068	3,114	+ 46	Ensilage, hay and meal.
Lot II.						
April 11—May 1..	1,486	.....	2,918	2,967	+ 49	Ensilage, meal and hay.
*May 16—June 5..	962	—524	†1,941	†1,770	†—171	Ensilage and hay.

*One cow sick for two days in this period. †Two cows only.

Conclusions as to Quantity.

1. With Lot I the extra amount of meal did not appear to have much effect on the quantity, as they gave but 66 lb. more milk in four weeks while getting meal than during the same length of time without meal. This may be accounted for in some degree by the fact that two of the cows in this lot had calved recently. Those in Lot II had been milking for a longer time when the experiment commenced.

2. Both Lots lost heavily in weight while getting ration No. 1, and gained considerably on the ensilage, meal and hay. One ration was not sufficient to sustain the live weight of the animals while giving milk, and the other caused them to lay on flesh without a corresponding increase of milk.

3. The cost per 100 lb. of milk from both Lots on ration No. 1 was 55.8 cents, while the cost when No. 2 was fed was $1.18 per 100. Such a large quantity of meal could not be profitably fed to these cows.

Analysis of butter :

Lot.	Ration.	Water.	Fat.	Casein.	Ash.	Iodine number.	Melting point.
I	No. 1—1st period	*9.36	87.06	0.99	2.59	32.00	32.25
II	No. 2—1st period	*9.74	86.49	1.04	2.74	28.32	34.15
I	No. 2—2nd period.....	*11.36	85.20	1.06	2.38	30.52	32.61
II	No. 1—2nd period.....	†11.90	84.78	1.01	2.31	33.32	33.33
	Average on Ration No. 1	10.63	85.92	1.00	2.45	32.66	32.79
	Average on Ration No. 2	10.80	85.85	1.05	2.56	29.42	33.38

*Average of four analyses and determinations.
† " three " "

It was observed in the practical handling of the samples, that the butter from Lot II was always firmer than that from Lot I, due doubtless to the influence of the animals composing this lot. It is rather remarkable what a difference one or two degrees in the melting point makes in the physical properties of butter. Both lots gave firmer butter or butter with a higher melting point when they were fed meals in addition to the ensilage and hay. Last year when the cows were fed ensilage chiefly it produced a butter with a low melting point (31.75 °). "Taking the average melting point (32.4 °) of the butter produced from the ensilage, hay, straw, and grass rations as a standard, we find that it was increased 2.3 ° C. when a mixture of oil meals and hay was fed; 1 °

when linseed meal alone was fed; 4.1° on the cottonseed meal ration.' If it is possible to feed something which will produce firmer butter, a butter that will "stand up" better in hot weather, the question becomes of much practical importance.

There appears to be little difference in the average composition of the butter produced by the two rations. I repeat what was stated in the last College Report, p. 169: "That the varying per cent. of fat, water and other substances found in butter, is likely due more to the method of manufacture than to the influence of food."

Losses of fat in skim-milk and buttermilk:

Number of trials.	Average p. c. fat in skim-milk.	Average p. c. fat in buttermilk.	Ration
Lot I... { 4	0.26	0. 1	Ensilage and hay.
Lot I... { 3	0.33	0. 1	Ensilage, hay and meal.
Lot II.. { 4	0.72	0.19	Ensilage, hay and meal.
Lot II.. { 3	0.48	0.15	Ensilage and hay.

Both Lots appear to have given slightly better creaming results on the ration composed nearly altogether of ensilage. The average per cent. of fat in the skim-milk from both, in seven settings being 0.37 of one per cent., while the average of the same number of settings, under exactly the same conditions, was 0.53, when the meal ration was fed in addition to the ensilage.

Practical Points for Farmers.

1. For practical use I would not recommend either of the rations used in this experiment. No. 1 I consider deficient in milk-producing substances, and No. 2 is too rich for our ordinary cows, as they did not appear to be able to digest and assimilate so much meal. I would also warn against feeding much more than 50 lb. ensilage per day to cows weighing under 1,000 lb. We have found the following ration to give good results: 50 lb. of corn ensilage, 6 lb. of hay, 4 lb. of bran, and 2 lb. of pea and oatmeal mixed in equal proportions. If these latter become too high-priced, I would recommend the use of 2 lb. of cottonseed meal (in place of the bran or meals) per day to each cow, when it can be bought for about $30 per ton.

Feed *liberally*, though not wastefully, bearing in mind that although the *per c nt.* of fat may not be increased by liberal feeding, the total amount of fat or butter may be largely increased by causing the cow to give a larger *quantity of milk*. Three things determine the value of a cow: *the quality of her milk, the quantity she gives*, and *the economical use she makes of her food.*

2. During the hot weather buttermakers are frequently troubled with soft butter. This is largely due, in most cases, to improper handling of the milk, cream and butter, but there is a tendency during hot spells for the butter to be soft no matter what the care taken. From the experiments here reported I am led to believe that the addition of a small quantity of meal, especially cottonseed meal, has a tendency to make the butter firmer, or as we say, raise the melting point from one to four degrees Centigrade. Last summer we fed about 1 lb. per day to each cow, while at pasture, and our butter-maker informs me that he did not have a churning of soft butter during the whole season. Whether this was due altogether to the cottonseed meal, I am not prepared to say, but I think it had something to do with it. In feeding cottonseed meal it should be mixed with bran, cut hay, or some grain meal.

MILKING.

Milking Three Times a Day.

To see what effect milking three times a day would have we selected two of our largest milkers, and milked them at 5 a.m., 11 a.m., and 5 p.m. of each day for 2 weeks, beginning June 23rd. Previously, each cow had been getting one pound of bran and two pounds of barley meal a day in addition to good pasture, but when we began milking three times a day their daily meal ration was increased to 2 lb. cottonseed meal, 2 lb. pea meal, 2 lb. bran, fed one-third in the morning, one-third at noon, and the balance in the evening.

The yield of the two cows for the two weeks previous to the experiment was :

Artis, 819 lb. milk ; 2.93 per cent. fat, 24 lb. fat.
No. 13, 531, " " 3.50 " " 18.59 " "

When milked three times a day their record for two weeks was :

	No. 13.		Artis.	
	Lb. milk.	Av. p. c. fat.	Lb. milk.	Av. p. c. fat.
Morning	263.5	3.27	357.5	2.70
Noon	141.5	4.18	180.0	3.42
Evening	144.0	4.16	172.5	2.96
Totals and averages	549.0	3.87	710.0	3.03

The total fat given by No. 13 in the two weeks was 20.27 lb., and by Artis was 20.80.

For the two weeks following July 6th, when the milking three times daily ceased, these two cows were fed the same quantity of meal twice a day as they had been previously getting three times a day, and were milked but twice a day at 5 o'clock morning and evening. Their record was :

	No. 13.		Artis.	
	Lb. milk.	Av. p. c. fat.	Lb. milk.	Av. p. c. fat.
Morning	250	3.47	308	2.72
Evening	239	3.62	299	2.80
Totals and averages	489	3.55	607	2.76

The total fat given by No. 13, was 17.06 lb., and by Artis 17.87 lb.

It may be interesting in this connection to note what difference there is between the total amount of fat credited to our cows by testing them two days in the week, and the actual amount of fat produced as shown when testing the cows every day.

In our regular dairy work the per cent. of fat in each cow's milk is determined on Monday evening and Tuesday morning, and Friday evening and Saturday morning, which tests represent the quality of milk produced during the week. Taking the tests of these two cows on the days mentioned from July 7th to 20th, No. 13 would have been credited with 18.39 lb. fat—actual yield, 17.06—and Artis 17.85 lb. fat—actual yield, 17.87. In the case of the one cow it gives almost exactly her yield and the other .79 lb. more than her yield.

By taking the average total lb. of milk and fat given during the two weeks previous to, and after the milking three times a day, we should have a fair basis on which to compare the results of milking twice and three times. No. 13 gave 510 lb. milk and 17.83 lb. fat as the average of the periods preceding and succeeding the experiment. During the experiment she gave in the same length of time 549 lb. milk and 20.27 lb. fat—an increase of 39 lb. of milk and 2.44 lb. fat. Artis gave 713 lb. milk and 20.44 lb. of fat as the average of the two periods when milked twice a day, and when milked three times a day she gave 710 lb. milk and 20.80 lb. fat—a decrease of 3 lb. milk and an increase of .36 lb. fat—in other words her yield was about the same when milked three times a day as when milked twice.

This experiment would seem to indicate :

1. Frequent milking increases the per cent. of fat, as both cows gave a higher percentage in their milk at noon and evening than in their morning milk. The average of these two and also of the three milkings per day was higher than their general average when milked twice a day. The effect on the total fat was to increase it in the case of one cow, while it remained about the same in the other.

2. One cow gave more milk when milked three times a day and the other gave less, presuming that the extra meal balanced the failing pasture.

3. It would not pay to continue milking these cows three times a day for any length of time, as they seemed to regulate themselves to normal production in a short time. It might pay for a short time by keeping the cow at high pressure.

Gland Milking vs. *Quarter Milking.*

The two cows used in this experiment (which commenced Nov. 14th, 1892, and continued two weeks) had been milking for some time. One, calved April 15th and consequently had been milking about seven months, while the other calved March 27th, and had been milking about eight months. We would naturally expect these cows to decrease in their milk owing to the advanced period of lactation. During the two weeks previous to the experiment Cherry gave 267 lb. milk, containing 4.67 °/₀ fat, or 12.47 lb. fat (about 13½ lb. butter). For the same length of time, during which gland milking was practised, she gave 266 lb. milk and 4.56 °/₀ fat. This would be 12.13 lb. fat, or about 13⅓ lb. of butter. Practically the same as for the two weeks previous.

Dairy Queen gave, previous to the experiment, 250 lb. milk, with 4.62 °/₀=11.55 lb. fat—about 13 lb. of butter in two weeks. When gland milking was done for two weeks she gave 228 lb. milk, with 4.07 °/₀ fat=9.27 lb. fat—about 10¼ lb. of butter.

The effect of eight months' milking showed itself markedly on this cow. Some might say, you should teach your cows to milk ten or eleven months in a year. In reply, I would say that we do not care if a cow milks but four months, *if she will give us from* 6,000 *to* 9,000 *lb. of milk in that time and make* 250 *to* 400 lb. of butter. A cow that gives 8,000 lb. of milk in six months is more valuable, other things being equal, than a cow that gives 8,000 lb. of milk in ten months, because she saves four months stripping, and time is money. As a matter of fact, however, we usually find that the cows which milk for the longest periods, say nine to eleven months, give the most milk in a year.

TESTING MILK AND CREAM.

Composite Samples.

The most common method of making composite samples is to take a certain measured quantity each day and put aside into a jar properly labelled. At the end of a week, or for whatever time the tests are allowed to run, the milk, which is usually thick and sour, especially in hot weather, is dissolved or thinned with potash or what is commonly known as powdered lye. This saves the risk of using poisonous substances, such as corrosive sublimate, to preserve the sample.

In eleven trials, the average percentage of fat in milk tested every day was 4.01. The composite sample of the same milk tested 4.10. In ten trials where the average of single tests was 3.96, the composite tested 4.00 In eight trials where the average was 4.11 taken every day, the composite from the same tested 4.05. These experiments confirm the results of last year, showing the composite test to be accurate where approximately the same amount of milk is being delivered each day, and where the same quantity is taken each day for the composite test.

In factory work, however, there is considerable variation, both in the quantity and quality of milk delivered each day during the week. This is especially so where patrons send perhaps Sunday morning's, and in some cases Saturday night's milk, to the factory on Monday morning, making about double the usual amount.

It will readily be seen that the composite sample should always bear definite relation to the quantity and quality of milk delivered each day. Where the same amount is taken each day from the milk delivered and put into the jar for a composite sample, this relation is not preserved, and consequently I have suggested the following plan :

Take a glass cylinder (with a lip) graduated to 50 or 100 c.c., which can be bought of dealers in chemical glassware, for about $1. Use according to the following directions :

For patrons sending less than 50 lb. of milk, take out 2 c.c. (medium marks) for every 10 lb. of milk.

20	lb., take out	4	c.c., or	4	medium marks.
30	"	6	"	6	"
40	"	8	"	8	"

50 lb. and over, up to 500 lb., take 1 c.c. (medium mark) for every 10 lb. of milk.

50	lb., take out	5	c.c., or	5	medium marks.
60	"	6	"	6	"
70	"	7	"	7	"
100	"	10	"	10	"
125	"	13	"	13	"
130	"	13	"	13	"
200	"	20	"	20	"
400	"	40	"	40	"
490	"	49	"	49	"

500 lb. and over, take one-half a c.c. (short mark) for every 10 lb. milk, or 1 c.c. (short mark) for every 20 lb. of milk.

500	lb., take out	25	c.c., or	25	medium marks.	
510	"	25½	"	25	"	and one short mark.
520	"	26	"	26	"	

In case a patron who usually sends less than 50 lb. should deliver *50 lb. or more* on one or more mornings during the week, *take 2 c.c. for each 10 lb. of milk.*

In case a patron who usually sends more than 50 lb. should deliver *less than 50 lb. take 1 c.c. for each 10 lb of milk.*

In case a patron who usually sends less than 500 lb. should deliver *500 lb. or more, take 1 c.c. for each 10 lb. of milk.*

In case a patron who usually sends more than 500 lb. should deliver *less than 500 lb take 1-2 c.c. for each 10 lb., or 1 c.c. for each 20 lb. of milk.*

I sent one of these graduated cylinders, together with directions, to the maker of the Elma factory, with a request that he give it a trial and report results. Their method of measuring samples is to take out a small dipper-full (about 50 c.c.) from each man's milk after it has been poured into the weigh-can, and put it into a pint gem jar labelled with the patron's name. This composite sample is tested about once a week.

He took samples of milk from a patron sending about 350 lb. per day. The results were .

Sept.	26—Test was	4.30	per cent.
"	27 "	4.35	"
"	28 "	4.30	"
"	29 "	4.10	"
"	30 "	4.00	"
	Average	4.21	per cent.

(Quantity of milk not given).

The composite sample taken with graduated measure tested..4.20 per cent.
" " " dipper in usual way " ..4.10 "

In another trial of a different patron's milk, one sending about 40 lb. per day, there was also a difference of $\frac{1}{10}$ of one per cent. in favour of the measuring glass.

There is no doubt about this being the most accurate way to take samples for composite test, but Mr. Gray adds in his letter, "I can assure you I hope we will not have to take samples that way, as it is a great deal more trouble."

The cheesemakers are so driven with work that any extra labor is viewed with disfavor by them. If further experiment should prove the necessity for using a more accurate method of taking samples, there is no doubt but the directors of the factory will see that the maker has extra help for this work. As the salesman of the Elma factory said to me, "We are bound to do this thing right if it does cost some extra labor and expense."

In any case I would advise those using the composite test to take a double quantity for a sample on Monday morning, where patrons deliver two days' milk instead of one.

Paying for Milk According to Percentage of Fat.

In addition to what is given in Bulletin 76 on this subject, I should like to add the report of an experiment conducted by Mr. James Gray, cheesemaker in the Elma factory, near Attwood, in the Listowel district. At this factory they have been paying according to the test during the past season. Being requested to visit this factory during the summer, I spent a part of two days there, observing results and discussing the new plan with the maker and directors of the factory. All expressed themselves as well pleased with the results, and said they would not go back to the old plan under any considerations. True, there are difficulties in the way, but these may be overcome by a persistent endeavor to do justice to each patron. The maker says that he has never been troubled with a "gassy" curd all summer, owing to the fact that patrons take better care of the milk to secure a higher test.

On August 30th Mr. Gray weighed into a vat 2,100 lb. milk, which tested 3.80 per cent. fat. This amount of milk produced 216 lb. of green cheese. Ratio of milk for one pound of cheese, 9.72 lb. September 1st into the same vat he weighed 2,100 lb., testing 3.55 per cent. fat. Product, handled in the same manner, was 200.5 lb. green cheese. Ratio milk to cheese, 10.47 lb. After one month there was still an advantage of 15 lb. in favor of the 3 80 per cent. milk, and yet some people say that all milk is about alike for cheesemaking. Buyers and judges pronounced the 3.80 per cent. cheese of better quality.

The composite test plan is adopted, the thick sample being dissolved with a small quantity of potash or powdered lye, and tests made once a week—sometimes five times

during a month. As this method makes some extra work for the secretary, it is but natural that the shortest way of arriving at results should be chosen. Sometimes, however, the short way is not the correct way. The plan at first adopted was to multiply the average percentage of fat for the month by the total pounds of milk delivered during the month. This would be just did patrons send the same amount of milk each week. But they do not. The following example taken from the milk books of the Elma factory for July will illustrate:

Patron A sent during the 1st week	1,426	lb. milk, testing	3.75	per cent.	fat.	Total fat,	51.475	lb.
2nd "	1,336	" "	3.60	"		"	47.096	"
3rd "	1,348	" "	3.80	"		"	51.224	"
4th "	1,601	" "	3.60	"		"	60.838	"
During time of 5th test,	919	" "	3.40	"		"	31.246	"
Total lb. milk,	6,630 lb.	Average fat,	3.63			Total fat,	241.879	lb.

If we multiply 6,630 by 3.63 this patron will be credited with 240.669 lb. fat, whereas he sent in 1.21 lb. more; hence the correct way is to multiply the pounds of milk delivered by the percentage of fat *each week* to determine the total pounds of fat delivered.

How to Determine the Fat at the Factory.

Milk chemists, dairy commissioners, cheese factorymen, creamerymen and dairymen generally nearly all acknowledge that what is known as the Babcock test is the most simple, inexpensive, accurate and rapid test now in use. Nearly all the experiment stations in both the United States and Canada, and the method is spreading to Europe and Australia, are using this test for the fat determinations in connection with a great deal of their work. This test, together with the lacto-thermometer, is also able to give approximate results as to per cent. of water and solids not fat present in a sample of milk.

To find out the amount of fat delivered by patrons of a factory in a month, or for any given time, weigh each patron's milk as formerly, take a sample each day and test it. The pounds of milk delivered, multiplied by the per cent. of fat found will give the total pounds of fat delivered that day. For instance:

T. Skimmer.....	delivers	150	lb. milk.	Test	2 per cent.=	3 lb. fat
John Fair.....	"	200	"	"	3 per cent.=	6 "
Wm. Good	"	200	"	"	5 per cent.=	10 "

Or it may be done in this way:

Take a sample from Mr. Skimmer's milk each morning—do so with each patron—place in a jar numbered so as to correspond with his name. At the end of the week take a sample from this jar, which will be his average quality of milk for the week. Suppose that it tests $2\frac{1}{2}$ per cent. fat. Suppose further that he sent in 150 lb. each morning for six mornings, then altogether that week he sent 900 lb. milk, which contained $900 \times 2\frac{1}{2}$, or $22\frac{1}{2}$ lb. fat. And so on with each patron.

How to Distribute the Proceeds.

At the end of the month, or whenever the books are made up, instead of adding up the pounds of milk sent in by each patron for the month, add up the pounds of fat delivered as found in the manner previously indicated. Having done this for each patron, total the pounds of fat delivered by all the patrons. Then divide the dollars to be distributed by the pounds of fat delivered, which will give the value for each pound of fat sent in by the different patrons

Some time ago I wrote Mr. I. L. Farrington, of Norwich, Ont., who owns and operates a number of factories in that section, asking for his method of distributing proceeds to his patrons. He sent me the following illustration :

Month of June.

Total lb. milk delivered	312,259
" cheese manufactured	30,321
Total value cheese	$2,609 54
Cost of manufacturing	363 85
Amount to be distributed	$2,245 69
Value 1 lb. milk = 2,245 69 / 3,122 59	.719c

John Smith	Cr.	4,804 lb.	@ .719c. =	$ 28 28
T. Jones	Cr.	200,000 lb.	@ .719c. =	1,438 00
A. Barber	Cr.	107,455 lb.	@ .719c. =	772 60
				$2,245 14

(Mr. Farrington sent but one name, but for the sake of completing the distribution I have assumed that the rest of the milk was supplied by two patrons, while as a matter of fact it was doubtless supplied by 40 or 50 patrons).

By distributing proceeds on the basis of its fat contents, assuming that the pounds of cheese made, cost of manufacturing, etc., were the same as in the instance previously cited, and everything similar except that the milk has been tested, the account would stand thus :

John Smith, Cr. 4,804 lb. 3 per cent. milk =	144.12 lb. fat
T. Jones, Cr. 200,000 lb. 3½ " =	7,000.00 "
A. Barber, Cr. 107,455 lb. 4 " =	4,298.20 "
Total lb. fat delivered	11,442.32
Value one pound fat = $2,245 69 / 11,442.32	=19.62c.

John Smith's share	144 12 lb. fat	× 19.62 =	$ 28 28
T. Jones' "	7,000.00 "	× 19.62 =	1,373 40
A. Barber's "	4,298.20 "	× 19.62 =	843 30
			$2,244 98

(To be very exact it would be necessary to carry the decimal point to the third place instead of to the second as I have done in calculating the price per pound for the fat).

In conclusion I would quote the opinion of Mr. A. T. Bell, of Tavistock, who had charge of the Dairy School last year, and who is not unknown to Ontario dairymen :

" In answer to yours *re* distribution of proceeds at a factory, would say that after the experiments which have been made here and elsewhere with the different qualities of milk for cheese, and noting the different yields of cheese from same, I am strongly in favor of paying according to the butter-fat, considering it much the fairest way. I am very much pleased that some of our factories are adopting that plan the present season."

Butter-fat in Milk and Cream.

Variation in Fat of Milk from the Herd and from Individual Cows of the Herd.

How wide a variation one may expect to find in the fat of milk from individual cows and from a whole herd is a question not yet settled. For over a year we have been testing each of our cows twice a week (morning and evening), some four times a week and some eight times a week and some every day. We find that while individual cows may and do vary widely in the per cent. of fat from day to day yet the milk from the whole herd does not exhibit such wide variation in quality—in fact tests made during the month of January, February, March and April show that the per cent. of fat is quite constant.

The following table gives the amounts of fat (per cent.) found in the milk of eight cows, morning and evening, as determined in eight days :

—	—	January 11.	January 27	January 28.	January 29.	February 19.	February 20.	February 29.	March 8.
No. 2	Morning	5.3	4.0	4.6	4.6	3.8	3.5	4.2	4.1
	Evening	4.2	4.8	4.5	3.9	4.4	.....	5.0	4.2
No. 4	Morning	3.8	4.2	4.4	4.4	3.5	3.2	3.8	3.7
	Evening	3.2	4.6	4.2	4.3	4.4	.....	4.5	4.2
No. 6	Morning	3.5	3.9	4.0	4.0	3.6	3.4	3.5	3.5
	Evening	3.5	4.0	4.0	3.7	3.8	.....	3.8	3.4
A. 2	Morning	2.5	3.0	3.7	3.3	.....	3.1	3.5	3.0
	Evening	3.6	3.8	4.0	4.2	4.6	.....	3.5	3.1
H. 1	Morning	2.7	2.9	3.2	3.0	....	3.2	.....	.....
	Evening	2.6	3.5	2.8	2.5	3.6	....	.....	.....
H. 2	Morning	2.8	3.0	3.0	3.0	.....	2.8	3.2	3.1
	Evening	3.1	3.0	3.2	2.6	3.2	.....	3.2	3.0
J. G. 1	Morning	2.8	4.5	4.8	4.6	....	4.0	4.0	4.1
	Evening	4.2	4.8	4.9	4.4	4.8	.....	4.4	3.7
No. 13	Morning	2.3	4.0	4.6	4.4	.....	.....	.....	.....
	Evening	4.8	5.3	4.6	4.4	.....	....	.....	.....

The following statement gives the highest, the lowest and the average per cent. of fat found in *the mixed milk from the whole herd* tested during the months of January, February, March and April. For a part of the time the fat was determined separately in the morning and evening milk, and in sixteen tests made in March the mixed milk of morning and evening was used.

—	Highest.	Lowest.	Average.
Morning milk, 43 trials	3.90	3.05	3.53
Evening milk, 25 trials	4.15	3.40	3.63
Morning and evening milk mixed, 16 trials	3.90	3.30	3.60

From this statement it appears that the widest variation in the morning milk during 43 trials was 0.85 per cent., in the evening milk during 25 trials 0.75 per cent., and in the combined morning and evening milk during 16 trials 0.60 per cent.

Total Solids in Milk estimated from the Per Cent. of Fat and the Lactometer Reading.

With our present short methods of determining the fat of milk, this part of dairy work has become comparatively easy. In cases where it is thought advisable to determine the solids-not-fat in the milk as well as the fat, it may be done approximately by the use of the Quevenne Lactometer (together with the fat per cent.) by the following formula recommended by Dr. Babcock :

$$\text{Solids not fat} = \frac{L + .7F}{3.8}$$

$$\text{Total solids} = \frac{L + .7F}{3.8} + F$$

L is lactometer reading at 60° F.
F is the per cent. of fat.

A shorter rule, which will give approximately the same results, is to add the per cent. of fat to the lactometer reading and divide by 4—this gives the solids-not-fat. The total solids are then found, by simply adding together the fat and the solids-not-fat.

Comparing results obtained by the use of this formula with those obtained by chemical analysis, we have found the following results in the milk from six cows, the average of the trials of each cow being given :

	Cow No. 2.	No. 4.	A. No. 2.	H. No. 2.	No. 13.	A. No. 3.	Average.
Number of trials	5	7	7	7	6	7	39
Lactometer reading	30.6	33.3	32.62	31.96	31.76	33.10	32.22
Fat according to Babcock test	4.14	3.86	3.34	2.89	3.22	3.86	3.55
Solids not fat by formula	8.77	9.48	9.20	8.94	8.83	9.41	9.11
Solids not fat by chemical analysis	8.29	9.37	9.10	8.72	8.83	8.98	8.83
Total solids by formula	12.91	13.34	12.54	11.83	12.05	13.27	12.66
Total solids by chemical analysis	12.43	13.23	12.44	11.61	11.75	12.84	12.38
Difference between formula and analysis	0.48	0.11	0.10	0.22	0.30	0.43	0.26

The average difference in the thirty-nine samples between the total solids are determined by the formula and by chemical analysis was only 0.26 *of one per cent.*, almost within the limits of error. This method promises to prove of value in ordinary experimental work or in the rapid analysis of milk, as thereby we may obtain approximately the per cent. of water, of fat, of solids not fat, and of total solids, in a few minutes and at small cost.

Pay for Milk according to per cent. of Fat.

Quality is of more importance than quantity in nearly everything. Quality or per cent. of fat is what the butter-maker desires most of all in the milk designed for the manufacture of butter, because butter is largely composed of fat—about 84 per cent. Therefore the fat in milk is an index of its value for butter.

It is also a proper basis on which to value milk for cheese-making, because—

1. The serum or pure skim-milk is worth only from 15 to 20 cents per hundred pounds, while the fat is worth from 15 to 30 cents per pound whether in cheese or in butter.

2. The casein or curd is fairly constant in all milk, while the fat varies widely in different samples.

3. The richer the milk in fat up to a certain limit the more pounds of cheese may be made from a given number of pounds of milk.

This method will give to each patron more nearly what is just than any other system that has yet been tried, besides taking away all temptation to tamper with milk designed for the manufacture of cheese or butter.

Testing Milk.

The testing of each patron's milk involves considerable labor; hence, we should study how to lessen the labor as much as possible. A device which we have used in the dairy building here for over a year makes the work of measuring and adding the acid very slight. A gallon bottle is kept full of acid. This bottle has an ordinary cork containing three openings—one for a glass syphon having a glass stop-cock, one for a glass funnel, and one small opening to allow the air to escape when the bottle is filled with acid. Such a bottle and syphon has been in use for about two years and requires no attention, neither has it given any trouble. With two acid measures, one of which is filling while the acid from the other is being poured into the test-bottle containing the milk, the work proceeds very rapidly.

Several inquiries have been made as to the cause of "curdy, crumbly matter" in connection with the fat when making tests with the Babcock tester. The causes are, I think, two:

1. Insufficient mixing of the acid and milk, or in some cases the acid is too weak.

2. Not keeping the bottles properly cleaned. If these become greasy they should be washed with soap-suds or sal-soda water. A small brush should be used for cleaning the neck of the bottle.

Testing Whey.

Every cheese-maker should test the whey each day from the vats, and thus check any losses of fat from this source. The drippings from the cheese ought also to be tested, as frequently there is considerable loss of valuable constituents by improper handling and pressing.

To test whey take the same amount as for new milk (17.6 c.c.), but only half the usual quantity of acid; or better still, get bottles which are specially made for testing whey, butter-milk and skim-milk. These bottles require twice the ordinary quantity of whey, butter-milk or skim-milk, and the ordinary quantity (17.5 c.c.) of acid for whey—twice the usual amount for skim and butter-milk.

Keeping Whey and Skim-milk sweet.

A question was asked of us recently: "Can skim-milk be treated so as to keep sweet for twenty-four hours?"

The answer was, yes, both sweet whey and sweet skim-milk may be kept sweet twenty-four hours in the hottest weather by heating to 150° or 160° Fahrenheit. This treatment kills the germs which cause the souring of milk and milk products. Most factories have steam, and the cost of heating the bye-product to a sufficiently high temperature to preserve them sweet would cost very little.

It has been demonstrated that *sweet* whey for feeding hogs is worth from eight to ten cents per hundred pounds compared with middlings and corn. What sour, stinking whey is worth has never been shown. We doubt whether it more than pays for the labor of hauling it to the farm and the feeding of it to the only class of animals that can thrive on it at all.

The Fat of Cream.

The present system of distributing proceeds to patrons of both cheese factories and creameries is causing distrust in the minds of operators and patrons. That it does not do justice in a cheese factory is conceded by nearly all. That the paying for milk according

to quality or on its fat basis is much more just is also pretty well established. That the fat basis is the proper one to adopt at a centrifugal or separator creamery none deny. Whether the test for fat, or the Babcock test, is likely to supplant the "oil test" in cream-gathering creameries is a query among creamery men at present. A leading firm sent the following to this department recently: "We have had several inquiries with regard to the practicability of applying the Babcock tester with the bottles made to test cream, and we have been asked our opinion as to whether this will answer for factories which are working on the cream-gathering principle. We have the bottles, which will show twenty-five per cent. of butter-fat, and we suppose they can be made to go still higher. What is your opinion about this matter? Do you think that the Babcock with these cream bottles can be made to take the place of the oil-test churn?"

In testing cream the following points require attention:

1. It is difficult to sample sour, thick cream properly. In this case it is best to dilute it with an equal volume of water and multiply the readings by two. For cream containing over twenty-five per cent. of fat a bottle with a detatchable neck reading to thirty-six per cent. of fat may be used (for description see Maine Report, Part II., 1891), or the sample may be divided into two bottles.

2. Sweet cream raised by cold, deep setting process may be sampled without difficulty. The pipette should be rinsed into the test bottle with a small amount of water.

3. The cream bottles cannot be used in one of our machines which has swinging pockets, but can be used in another in which the pockets are stationary.

4. In adding hot water after the whirling, care should be exercised that the bottom of the column of fat does not come in the bulb, which is not graduated.

5. If creameries adopt this plan great care should be observed in taking the samples that they may be fair representatives of the whole of the cream.

6. Owing to the fact that fat expands on the average .078 for every degree centrigrade, it is important that all samples be read at approximately the same temperature—140° to 150° F.

7. This test gives the *absolute* amount of fat in the cream, and judging from the trials previously noted we may expect more pounds of butter than there are pounds of fat in the cream.

We have made several determinations (by the Babcock method) of the fat contained in cream, with the following results: In testing cream a pipette measuring 18 c.c. is required. The bottles we use are graduated to read up to 25 per cent. of fat. The neck has a bulb and the same amount of acid is used as for whole milk.

Date.	Per cent. fat in cream.	Total pounds fat in cream.	Pounds butter yielded.	Pounds fat for one pound butter.	Per cent. of fat in butter-milk.
May 18	18.9	9.64	10.25	0.94	.....
" 21	18.1	4.98	5.50	0.91	0.10
" 21	17.2	3.10	3.60	0.86	0.10
" 21	20 0	3.49	3.40	1.03	.....
" 23	20.6	16.10	20.20	0.79	.....
" 26	27.2	9.52	12.00	0.79	.....
" 28	16.6	4.15	5.50	0.76	0.10
" 28	15.0	4.28	5.50	0 78	0.10
" 28	14.6	2.34	3.00	0.77	0.05
June 4	17.0	4.08	4.90	0.83	0.20
" 4	18.2	3.09	3.60	0.86	.....
Average	18.5	5.89	7.04	0.84	.....

To divide the cash proceeds at a creamery the following plan may be followed:

A delivers	500	lb. cream	containing	25	per cent.	fat, or 125	lb. fat.
B "	600	"		20	"	120	"
C "	400	"		15	"	60	"
					Total delivery is	305	"

Sale of butter gives 350 lb. at 20c. or $70.

The net value of each pound of fat delivered therefore is $70 divided by 305 or 22.95 cents.

Therefore—

A's share is	22.95	×	125	or $28.68
B's "	22.95	×	120	" 27.54
C's "	22.95	×	60	" 13.77
		Total divided,		$69.99

CREAMING AND CHURNING.

Effect of Temperature in Creaming.

Ten trials were made with milk skimmed at an average temperature of 41°. The average per cent. of fat in the whole milk was 4.05, and in the skim-milk there was an average of 0.25 per cent. when set for 14.5 hours.

In ten trials, where an equal quantity of the same milk as in the previous experiments was used and skimmed at an average temperature of 51°, the percentage of fat in the skim-milk was 0.80. This means a loss of about one pound of butter in every 100 pounds of skim-milk. As a result of numerous experiments we are led to conclude that it is necessary to cool milk down to 45° or below to obtain the best results from cows fresh in milk, and with strippers it is almost impossible to obtain good creaming results by deep-setting methods. When the milk is set in ordinary well water and the water is not changed at least twice soon after setting, great loss of cream results. In fact to get satisfactory creaming with deep pails or creamers, ice or cold spring water is necessary.

I estimate the loss of cream and butter throughout the Province to be about 25 per cent. owing to the lack of requisites to obtain good results with the various deep-setting methods.

Delayed Setting.

Milk containing an average of 3.92 per cent. fat, set at an average temperature of 82° for ten to twenty-four hours, when skimmed at a temperature of 40° had 0.14 per cent. fat in the skim-milk as an average of ten trials.

An equal quantity of the same milk was set for the same number of times and under the same conditions, except that it was delayed for some time cooling down to an average of 71°, and contained as an average of ten trials 0.21 per cent. of fat in the skim-milk. These experiments corroborate the results of last year, when a difference of but 0.14 per cent. was found in favor of immediate setting.

In six trials with the same milk where it was cooled to an average of 45° before setting, by keeping the milk stirred in ice water and then set for the usual length of time, there was an average of 0.42 per cent. fat in the skim-milk when skimmed at 40°. This would seem to indicate that the cream will rise fairly well even under adverse conditions if it be cooled to the proper temperature before being skimmed.

Effect on Creaming of Heating Milk and the addition of Hot Water.

From September 12th to 28th ten trials were made with mixed milk from the whole herd to see the effect of heating and the addition of hot water to milk for creaming purposes.

The average temperature of the milk, set as soon as possible after coming to the dairy, was 84° ; temperature when skimmed at from ten to twenty-four hours, 43° ; per cent. fat in skim-milk, 0.29.

The average per cent. of fat in the skim-milk, when lots of the same milk were heated from 93° to 110° (average 98°), was 0.295.

When 10 to 25 per cent. of water, at a temperature of 118° to 160° (average 138°), was added to ten lots of the same milk the average percentage of fat in the skim-milk was 0.22 (corrections made for water added). The three lots in each case were, set in the same creamer and skimmed at the same temperature, about 43°. There was a slight difference in favor of the addition of hot water, but not enough to pay for the trouble.

Skimming Close to the Cream Line.

In sixteen trials the average per cent. of fat in the first pint of skim-milk drawn from the bottom of the can was 0.26. In the last pint, or in the skim-milk next to the cream line, the average per cent. of fat was 0.34. In some cases there was more fat in the first pint of skim-milk drawn than there was in the last pint next to the cream line. In other trials this was reversed. Most frequently there was a larger percentage in the skim-milk next the cream. The highest per cent. of fat found next the cream line was 0.7, the lowest a "trace." The highest found in the bottom of the can was 0.4, the lowest .05. The greatest difference between the two portions of skim-milk was 0.3 per cent.

Lesson: Do not skim too close to the cream line, although we did find so great a difference between the skim-milk at the bottom of the can and that next to the cream line as others have done.

AERATING MILK FOR BUTTER-MAKING.

The object of these experiments was to determine the effect of aeration on the creaming of milk, churning of the cream, and the quality of the butter. The plan of aerating was to pour from one vessel to another. The milk from the herd was equally divided after thorough mixing, one-half was aerated and the other not, and both lots were then set in the same creamer under exactly the same conditions.

Date.	Not aerated.						Aerated.			
	Number settings.	Hours set.	Average temperature.		Per cent. fat skim-milk.	Per cent. fat buttermilk.	Average temperature.		Per cent. fat skim-milk.	Per cent. fat buttermilk.
			Set.	Skimmed.			Set.	Skimmed.		
October 20-22	4	22	83	40	.20	.20	82	40	.15	.30
" 27-28	4	22	84.2	41	.12	.20	84.2	41	.15	.20
December 1-3	5	22	85	40	.55	.50	85	40	.50	.50
" 9-11	5	20	86	39	.21	.20	84	39	.21	.20
Averages	.....	.....	84.6	40	.27	.28	83.8	40	.25	.30

The churnings from each lot were packed in two separate tubs, and at this date (December 21st) when examined there was no difference in the quality of the butter so far as we could tell.

Sweet *vs.* Ripened Cream.

The object of this experiment was to see the effect of ripening cream on the time required to churn, the loss of fat in the butter-milk, and the quality of the butter. In each trial the cream was thoroughly mixed and divided while sweet. One-half was ripened and the other churned sweet. The results of four churnings are :

Date.	Sweet cream.							Ripened cream.						
	Pounds cream.	Temperature churned.	Time in minutes.	Per cent. fat in butter-milk.	Temperature butter when finished.	Temperature room.	Size churn.	Pounds cream.	Temperature churned.	Time in minutes.	Per cent. fat in butter-milk.	Temperature room.	Temperature butter when finished.	Size churn.
October 26	43.25	53	39	.40	58	63	No. 5 Daisy.	44	59	30	.30	63	60	No. 2 Daisy.
November 5	26	47	38	....	59	62	"	26	58	40	....	62	58	"
" 26	36	52	45	.40	60	61	"	36	63	20	.20	61	....	"
December 1	35.25	52	90	.40	61	56	"	35.25	64	45	.20	56	66	"
Averages	.....	51	53	.40	59.5	60.5	.....	.....	61	33.7	.23	60.5	61	.....

In each case there was a greater loss of fat in the buttermilk from the sweet cream churnings. The average time required to churn was also greater. It will be noticed that during the last churning the temperature of the room was 56°, and the time required to churn was one hour and thirty minutes. It will also be noticed that in every case the temperature of the cream rose to about 60° before butter was made. The ripeness of the cream, the temperature of the cream, churn and room, the size of the churn and the speed of the churn, all have an influence on the time required to churn.

The butter from each lot of cream was examined on December 21st, having been placed in two separate tubs, and the ripened cream butter is of good quality and fine flavor, while that of the sweet cream is off in flavor and is not nearly so valuable. A pound print of each lot was wrapped in parchment butter paper on October 21st, and kept in the refrigerator. When examined on December 21st, the print of ripened cream butter was pronounced of better flavor than the sweet, although not so good as the tub (tin-lined) of ripened cream butter.

TRAVELLING DAIRIES.

At the commencement of the work I took charge of the western division of the travelling dairy for a few days to assist Mr. Linfield. Being relieved almost wholly of the management of this dairy during the past year, I had more time to devote to other lines of investigation. For fuller accounts of the work done, see the reports of the instructors, which follow.

This work needs no defence this year. It speaks for itself. The following, clipped from a Toronto daily under the head of "Items from Belleville," shows how the work has been appreciated in this district :

"Since the travelling dairy has visited this section, an impetus has been given to local dairying. Ogden Hinch has instituted a winter creamery in Lennox County, and at a largely-attended meeting, the farmers in the county unanimously decided to give the factory every support."

Instead of being a hindrance to the establishment of creameries, as some persons predicted, experience has proven the effect to be the very opposite. It has created a stir among dairymen such as has never been done before in the same length of time and for the same outlay of money. It could scarcely be otherwise from the character of the meetings.

REPORT OF MR. PALMER.

To Prof. H. H. Dean :

Sir,—I have the honor to submit the report of my work with the travelling dairy in Eastern Ontario during the season of 1892.

About the latter part of April I returned from the States of Wisconsin and Illinois, where, in accordance with your advice, I had spent nearly three months studying the scientific and practical side of the dairy business, so that I might be better fitted to give instruction in the different lines of dairy work.

On arriving in Guelph I got ready the outfit necessary for the travelling dairy, which was substantially the same as that used by you at the dairy meetings last summer. The apparatus consisted of an eight-bottle Babcock milk tester, with the necessary accompaniments to make tests of milk ; a No. 3 Daisy barrel churn, a tin-lined water tank, a No. 1 Lever butter worker of about 15 lb. capacity, a pound butter printer, parchment butter paper for covering prints, a refrigerator butter box of about 48 lb. capacity, weigh scales, cream can, deep setting cans, thermometers, a supply of good dairy salt, and such utensils as are used by butter-makers who aim to make the finest butter with the least labor.

Everything being arranged according to your instructions, on the 2nd day of May I left Guelph for Gananoque in Leeds county, being accompanied by John A. McTavish, a butter-maker who had spent the previous six years working in butter factories owned by Mr. John Hannah, of Seaforth. Arriving in Gananoque we found ready for us a fine team of bay mares, weighing about 1,100 lb. each, and a large express waggon with buggy top, which had been made for the purpose by order of the Minister of Agriculture. To protect the utensils when travelling from place to place, a large piece of water-proof canvas was provided, which completely covered the load, and afforded protection from the sun and rain. After getting our outfit together, we started for Seeley's Bay, the first place on our list, at which we were to hold a meeting.

General Plan of Work.

On first starting out, President Mills directed us to drive from place to place as mentioned on our list, and hold meetings at the hour named, according to the arrangements that he might make with the officers of the Farmers' Institutes in each county. The institutes would also attend to the advertising, and the arranging of the necessary details for the meetings. This plan was the one followed during the season. The names of the places in each county at which meetings were to be held were furnished us beforehand so that we could drive on to the next point in the morning in time for the meeting at 2 p.m., the usual time of commencing.

Owing to the fact that the advertising in some places was not properly attended to, nor the arrangements at all satisfactory, it was deemed advisable to send out a man from the College to confer with the secretaries of the institutes as to the advertising and the arranging of the details. This was done during the latter part of the season. It is with pleasure that I can testify to the thorough work of F. C. Harrison, B.S.A., who, under the direction of President Mills, travelled over part of our route, directing the secretaries as to the best way of advertising and arranging the meetings. This made it much more pleasant and satisfactory for us when we came into that part of the country.

Work Accomplished.

Our season's work extended from May 2nd to Dec. 15th, a period of seven and a-half months. During that time we covered fourteen counties, holding meetings from five to twenty-five miles apart. These meetings were arranged at different places, so that every farmer in the county could attend if he so desired.

The counties travelled over, the places visited, the number of meetings held, the pounds of butter made, and the samples of milk tested in each county were as follows :

Counties.	Places visited.	Meetings held.		Pounds butter made.	Samples milk tested.		
		Afternoon.	Evening.		New milk.	Skim milk.	Butter-milk.
Leeds	15	15	13	95½	176	6	20
Grenville	11	11	10	88	235	11	12
Dundas	12	11	4	85¼	256	10	12
Stormont	8	8	2	77	90	2	8
Glengarry	9	9	1	57	118	2	9
Carleton	9	9	..	59¼	38	3	9
Lanark	12	12	1	70¾	86	..	17
Renfrew	19	19	..	141½	131	4	19
Frontenac	13	13	..	88¾	96	10	13
Lennox	7	7	1	41½	84	4	7
Addington	6	6	..	53	22	1	14
Hastings	14	14	..	81⅓	147	12	14
Prince Edward	8	8	..	52¼	122	12	13
Northumberland	8	8	..	59¾	178	15	14
	151	150	32		1,778	92	181

From the above it will be seen that we held meetings at 151 different places : 150 meetings were held in the afternoon, when the practical butter-making and milk-testing were illustrated, and 32 in the evening. During the entire season we drove 2,057 miles, the team of horses bought for the purpose proving well suited for the work.

Mode of Conducting Meetings.

Arriving at the place of meeting, we unpacked our utensils in the hall or building provided for the purpose, and were ready to begin proceedings at the hour advertised usually at 2 p.m. About three gallons of ripened or soured cream (and some ice in the summer) were arranged for ahead to be delivered at the hour of meeting. If the people supplying this cream had in every case followed the directions sent out to them, we should have had much better satisfaction in the making of the butter. As it was, in many cases, sweet cream was brought to be churned, while sometimes, the condition or flavor was such that it would be impossible for anyone to make a good quality of butter from it. In a few instances, the cream failed to turn up, but in only three places, during the entire season, was it found impossible to obtain any.

In my opening remarks I found it necessary to lay especial stress on several points in connection with the dairy, viz.:

1. That we were not agents, nor had we any private interest in the sale of the utensils we used, but we would be very pleased to give the addresses of reliable dealers who handled them.

2. That we were not sent out to induce people to make butter at home, instead of taking the milk to butter or cheese factories.

3. That we did not know all about butter-making, but had simply come to discuss the matter and help those interested in dairying in every way possible.

4. That we had no new patent process of making butter, but simply made it, in somewhat the same way as it was made in butter factories and on some farms, aiming to make it with the least labor and in the shortest time possible, and at the same time produce an article that would suit the market.

The value and importance of the cheese industry was then touched on and the need of carrying on dairy operations during the winter, when the best butter could be made, and when the price was high. The importance of adopting the factory system in butter-making as in cheese-making was always brought prominently before the meeting.

While Mr. McTavish conducted the practical part of the work, such as the straining of the cream, the churning, washing, working and printing of the butter, I endeavored to give a practical talk on the subject of butter-making, from the care of the cows, to the marketing of the butter, taking up the different methods of setting the milk, the best way to handle the cream, the best style of churn, etc., at the same time inviting discussion and criticism from all present. The audiences were also invited to inspect the butter when it first broke, and to note particularly the advantage of washing it when in the granular state, instead of gathering it in a lump and washing after removal from the churn. The salting and working of the butter was a point that received especial attention, also the putting up in neat shape for the markets. The Babcock tester was used at all the meetings, and its value and use thoroughly explained. The afternoon meetings lasted from one and a half to nearly four hours.

During the first part of the summer, the people attending in the afternoon were so anxious to have a second meeting, that it was found advisable to have an evening session. Thirty-two of these evening meetings were held in all. They were conducted somewhat on the plan of an institute meeting, but the Babcock tester, operated by Mr. McTavish, was an additional item. We found, however, that two meetings per day made the work altogether too hard for two of us, so we discontinued them. During the season I delivered one hundred and eighty-three lectures, those in the evening relating to some department of dairy farming, such as "Winter Dairying," "The Care and Feeding of Dairy Cows," "The Markets for Dairy Products, etc," and those in the afternoon to the more practical part of butter-making.

The Babcock Tester.

One of the most important parts of the apparatus we carried with us was the Babcock tester. It is really marvellous what an interest this tester has created throughout the country! And rightly, for it is designed to work a vast change in dairy farming in the next few years.

People were invited in the posters or bills to bring samples of milk to the meetings. This they did, and sometimes in such numbers that it was found necessary to test many after the meetings were over. The highest number of samples brought to one meeting was eighty-six.

Four points were mentioned in referring to this tester:

1. Its use in cheese factories as a means whereby to pay patrons according to the quality of the milk.
2. Its use in testing individual cows so as to weed out the unprofitable ones.
3. Its value in pointing out the effect on the milk of different feeds, harsh treatment, exposure, etc.
4. Its use in testing the skim-milk, butter-milk or whey to note and correct the losses that might occur.

The Dairy Cows.

The number of samples of milk tested amounted to over two thousand. Occasionally people brought in milk to test which showed by the excessive amount of fat it contained, that it must have been strippings or part cream. The results of tests such as these were not recorded, but only those which appeared to have been accurately taken, with a view to finding out exactly what the cows were doing. The number of tests of new milk recorded amounted to 1,778. Those tested the first part of the season ranged from about 2.7 per cent. fat to over 4 per cent. In the autumn, when most of the cows were strippers the percentages of fat ran considerably higher and were rarely under 4.0 per cent. When in the county of Glengarry, about the middle of July, I made a careful test of a herd of cows belonging to a prominent farmer near Martintown. We first weighed the milk from each cow, evening and morning, and then mixed a sample of the evening and morning milk, which was tested with the Babcock. The results given below, are, I think, both interesting and instructive, in that they show perhaps about the average production of a herd of cows at that season. They were chiefly Ayshire and

Shorthorn grades, and were the result of breeding from thoroughbred sires for a few years without any definite aim and with no especial weeding out of the unprofitable ones.

No.	Pounds milk per day.			Per cent. fat.	Pounds fat.
	Evening.	Morning.	Total.	Evening, morning, milk mixed.	
1	10½	9½	20	3.5	.7
2	11¼	8½	19¾	3.5	.7
3	9	7½	16½	4.0	.7
4	9½	8	17½	3.7	.6
5	15	12¾	27¾	3.7	1.0
6	19½	15	34½	3.1	1.0
7	12	11½	23½	3.0	.7
8	18	18½	36½	3.3	1.2
9	8½	7½	16	3.7	.6
10	14	11	25	3.3	.8
11	9	7½	16½	3.5	.6
12	12	9¾	21¾	3.4	.7
13	14	9¾	23¾	3.7	.9
14	15	12	27	3.6	1.0
			325½	3.5	11.4

The total amount of milk produced was 325½ lb., or an average of slightly over 23 lb. per day from each cow. The average per cent. of fat was 3.5 and the total amount of fat produced per day 11.4 lb., equivalent to 13.6 lb. butter (reckoning butter to contain 84 per cent. fat).

The difference between the production of the poorest and best cows was .6 of a pound of fat, or slightly over .7 of a lb. of butter per day. Supposing the butter sold for 20 cents per lb., that would simply mean that cow No. 8 would bring in just 14 cents more per day than cows Nos. 4, 9 or 11, if all the butter-fat were recovered from the milk. There would of course be more or less of a loss in the skim and butter-milk, but that would probably be just as heavy with the poor as with the good cow.

In the case of cow No. 1, the evening milk was not weighed. I put it down, however, as 10½ lb. A test of the herd milk in the evening showed 3.4 per cent. fat; in the morning 3.8 per cent. The fact that there were strangers in the stable during the evening may have excited the cows and lowered the quality of the milk.

After carrying on this work of testing the milk cows in different parts of the Province I am more than ever convinced of the need there is for the dairyman to devote especial attention to this part of his business. Four things seem necessary: 1. To provide warmer stables; 2 To feed better; 3. To breed with more care; 4. To keep continually testing and weeding out the poor cows.

There is not one dairyman in a hundred who feeds his cows up to their full capacity for producing milk. In many cases about the only time that the unfortunate animals get enough to eat is in the months of June and July when the pasture is at its best.

Breeding with a definite aim in view is also a point that requires attention, while the testing and weeding out of the poor cows is a very important part of the business. A man asked at one of our meetings, "At what price can I sell my milk per 100 lb. to realize a profit on it?" That man, like many others, "put the cart before the horse." He looked to the markets but neglected the home end. He did not take into account at all, the cost of producing, but thought only of the price obtained. Cheap foods and good cows, in fact *cheap production* is a prime necessity among dairymen at the present time.

Losses in Skim and Butter-milk.

Twenty-two samples of skim-milk brought in by farmers, and one hundred and eighty samples of butter-milk were tested during the season. Of the latter thirty were brought in by farmers, the rest were from our own churnings.

The skim-milk averaged 7/10 of 1 per cent.fat,the butter-milk from the farms 1.1 per cent., and from our own churnings 7/10 of 1 per cent. The lowest test of skim-milk was 2/10 of one per cent., the highest 2.5 per cent. fat.

We found in the autumn, except in a very few cases, that the skim-milk tested very rich in fat. The reason was that most of the cows were then strippers, and hence the milk did not cream well. In two or three cases, when there were one or more fresh calved cows in the herd, we found the loss in the skim-milk much less. A very important factor in the cheap production of butter is the amount lost in the skim-milk. Great care should therefore be exercised in the setting of the milk. In order to obtain all the cream in the fall, it was recommended: 1st, To have some of the cows calve at that time, or 2nd, To dilute the milk before setting, at the rate of one quart warm water (100° to 120°) to every 3 gallons of milk. By adding this amount of water, the milk is thinned and still the relative difference between the specific gravities of the skim-milk and cream is not decreased to any extent. A large amount of water would of course lessen that difference; then the tendency would be for the cream not to rise.

The practical value of this plan was shown in the case of Mr. B. Mallory, of Frankford, who on November 20th set two cans of milk from stripper cows in ice cold water for 12 hours, one diluted as mentioned above, the other set as it came from the cows. The former tested seven-tenths of one per cent. fat, the latter one per cent. Mr. T. B. Carlaw, of Warkworth, practises warming the milk in the fall to 130° before setting. We found in his case on December 8th, that when the milk was set at 98° in deep cans in ice water the loss was 1.1 per cent., when it was warmed to 130° before setting, the loss was only six-tenths of one per cent. In cases where turnips are fed this warming has also the effect of driving off the turnipy odor to a certain extent.

My experience in regard to the use of shallow pans *vs* deep cans by the farmers is, that by using the latter intelligently, not only more cream is obtained, but the cream is also of much better quality. There is not one farm house in thirty, where a suitable place can be found to set the pans. The labor in connection with them is also much greater than it should be. It will certainly be a vast improvement when the cream separators come into general use.

In the case of the butter-milk we also found in many of the samples from private dairies a heavy loss, the lowest was three-tenths of one per cent. fat; the highest 2.5 per cent. In one churning the lowest test of butter-milk was two-tenth per cent.; the highest 2.4 per cent. Sweet cream was sometimes brought to the meetings to be churned and very often sour cream that had not been sufficiently stirred, hence there was a heavy loss in the butter-milk.

We could generally trace the losses in the butter-milk brought to the meetings to one or more reasons, such as:

1. Keeping the cream in different vessels. To have it all evenly ripened it should be mixed at least 12 hours before churning.
2. Insufficient stirring.
3. Adding sweet cream just before churning.
4. Churning in too short a time.

We often met with people who warmed the cream to such a high temperature, that the butter came in five, ten or fifteen minutes. A poor practice if it is desired to get all the butter from the cream.

Accurate Thermometers.

In view of the fact that butter-makers have a great difficulty in getting good reliable thermometers, I recommended the following plan of testing one before buying, as given by Lynch in his "Scientific Dairy Practice," page 59, and as found practical by myself.

"When making a selection in the store place several of the thermometers in a dish of water. If three of these indicate exactly the same temperature, one of them may be selected with considerable certainty that it will prove correct. If they all show a different temperature, then try several more in the same way. If none of them show the same temperature, it would not be wise to purchase any of them." The thermometer used by us during the latter part of the summer and the best one I have yet seen, is called the "New Floating Dairy." This thermometer is tested when made and can be relied on as being correct. It costs 75 cents and can be obtained from any of the reliable dealers.

Attendance at the Meetings.

The meetings on the whole were largely attended, not only by representatives of the farming community, but by manufacturers, buyers of butter and cheese, and consumers as well. Cheese-makers came out in large numbers, especially to the evening meetings to witness the practical work with the Babcock tester and to pick up points in butter-making.

The attendance varied from about fifteen up to over four hundred people. The average attendance ranged from about fifty to one hundred.

Although we visited the counties of Stormont, Glengarry and Lanark, just at the busy season when the farmers were hard at work saving their hay and grain crops, it was surprising what large audiences we had sometimes. People attended once, and then drove many miles so as to be present the second time.

On the whole the poorest meetings we had during the whole season were in parts of Dundas and in Carleton. The poor attendance in these districts was largely due to the fact that the secretaries of the institutes did not take enough trouble to advertise the matter properly, nor were the arrangements at all satisfactory in some instances.

The Country and the People.

It would be impossible in the small space allowed here to give a correct description of the different sections of the country passed through, or the people met with.

From May 3rd to July 15th, we were busy holding meetings in the counties of Leeds, Grenville, Dundas, Stormont and Glengarry. This section of Ontario is settled by live energetic dairymen, men who are anxious to obtain information and not afraid to show their desires in that respect.

The land is rolling in some parts, affording excellent pasturage, with abundance of pure cold water. Down through Dundas, Stormont and part of Glengarry there are stretches of almost perfectly level land that needs only a good system of under-draining to make it equal to any section of Ontario for producing crops suitable for the production of milk.

It is simply incredible the number of cheese factories one meets with in this part of the country—too many altogether for the amount of cheese manufactured. It would be much better for the patrons and the manufacturers if these factories were larger and situated at greater distances apart. As it is now, owing to the close competition in some districts, if the milk is rejected at one factory, the patron promptly takes it to another, where it is not refused.

Finishing Glengarry we next proceeded to Carleton and Lanark where the people as a whole give more attention to general farming. From Lanark to Renfrew up the Ottawa as far north as Pembroke, then down the western side through the townships of South Algona, Brudenell, Sebastopol, Griffith, Grattan and Matawatchan, a portion of Ontario once famous for its timber, now noted for its scenery, minerals and bad roads. We had some very large meetings in Renfrew, especially in the townships of Horton, Ross and Westmeath. In the western portion of the county which is much rougher we did not expect very large meetings, and were not disappointed in that respect, but those who came appeared deeply interested in all that was done. From Renfrew down through Frontenac as far south as Kingston and over to Wolfe Island, next through Lennox, then up north again through Addington, as far as Flinton in Kaladar township. Across to

Hastings county and down through that immense county stretching from the Bay of Quinte up to Nipissing and which is second only to Oxford in its yearly output of cheese. The northern parts of Frontenac, Addington and Hastings are decidedly rough and broken, but the farmers are alive to their best interests and gave us a warm welcome wherever we held a meeting. After holding meetings at fourteen different places in Hastings county, we next proceeded to Prince Edward and from thence to Northumberland. In the two latter counties we had probably the largest meetings of any held during the season, those in Lennox perhaps excepted. After holding our last meeting at Roseneath on December 15th, we drove back to Guelph, a distance of one hundred and twenty-six miles.

Conclusions.

When the travelling dairy was first sent out by order of the Minister of Agriculture it was thought by some of the cheese and butter manufacturers, that its influence would tend to bring the factories into disrepute and thus undo the work of many years, by which the farmers have been induced to adopt co-operative methods in cheese and butter-making. The results of two years' work have surely proved the contrary. Speaking for the eastern division of the dairy, I may say that in every case we urged the adoption of co-operative methods in making butter. In districts where cheese factories were already established, we showed the advantages of making butter in the same building during the winter, at the same time advising the people not to go into the matter too hurriedly, but to discuss the advantages of a system among themselves, also to prepare for it by growing cheap feeds and by providing suitable stables for the cows so that winter dairying could be profitably carried on.

In districts where creameries were already established we urged the operating of these creameries all the year through, instead of only for six or seven months.

As mentioned before, the results of the work prove the contrary to what was expected by some, for in the very districts that we travelled through last season, there were at least twelve cheese factories operated as butter factories during the winter. Had the influence of the dairy extended in the opposite direction, this would not have happened.

As a help to the cheese and butter factories, in improving the condition of the cows and the condition of the milk delivered at the factories, as a help to the private dairymen, as a factor in improving the butter made in Ontario and increasing its sale, the travelling dairy must certainly prove a power for good.

Many people may come to such meetings and go away without apparently having taken much interest in what was said or done, but they begin to think and in time work out their own salvation by adopting those principles which they have actually seen in operation or heard spoken of. One needs to attend several of such conventions as those held in connection with the travelling dairy, to realize fully the interest that is aroused. This not only refers to the farmers, but to their wives also.

Before closing this report, I desire to express my appreciation of the services rendered by Mr. McTavish as butter-maker in connection with the dairy. Always neat and tidy in his work, he did it in such a manner as showed to the ladies present, that he was a practical butter-maker in every sense of the word.

In conclusion, allow me to tender my sincere thinks to those members of the Provincial Legislature who so willingly helped us along in our work, also to the officers of the different institutes who in some cases went to a great deal of trouble to have all the arrangements satisfactory, and lastly to the hospitable people of eastern Ontario for the manner in which they received us in their midst.

I have the honor to be, Sir,

Your obedient servant,

W. J. Palmer.

REPORT OF MR. LINFIELD.

To Prof. H. H. Dean:

SIR,—I hereby submit a short report of my season's work with the travelling dairy.

Mr. Hume, (my assistant and butter-maker) and myself, started from the College on the morning of the 4th of May. Our outfit consisted of the same as that of last year, viz. A No. 3 "Daisy" churn, a lever butter-worker, ladles, and a mould for printing the butter, a pair of scales, tin pails, cream pail and dippers, one of them with a perforated bottom for straining the cream when putting it into the churn. We also had a Babcock test machine and the appliances necessary to work the same. For facility in getting to each township in the different counties visited, as well as for economy, a team and strong spring wagon were bought and everything packed securely. It was thus readily moved from place to place. The meetings were arranged ahead, as those of last year, by communication with the secretaries of the Farmers' Institutes and the members of the Legislature. The cream required at each place was supplied by some one in the neighborhood, instructions being sent to them as to its care and preparation.

We started the season's work in the county of Wentworth. Meetings were held at Freelton, Waterdown, Bullock's Corners, Rockton, Lynden, Jerseyville, Ancaster, Mt. Hope, Binbrook, Tapleytown and Stoney Creek. In Lincoln, at Grimsby, Smithville, Beamsville, Campden, Jordan, at Grange Hall in Louth and Virgil. In Welland, the dairy visited Niagara Falls South, Netherby, Stevensville, International Bridge, Ridgeway, Humberstone, Welland, Crowland and Allanburg. In Monck County, at Pelham Centre, Marshville, Wellandport, Dunnville and Canboro'. In Haldimand County, at Cayuga, Nelles, Corners, Selkirk, Jarvis and Caledonia. In Brant, at Onondaga, Cainsville, St. George, Glen Morris, Paris, Falkland, Burford, Mt. Pleasant and Oakland. In Norfolk, at Waterford, Windham Centre, Simcoe, Port Dover, Vittoria, St. Williams, Langton, Delhi and Courtland. In Elgin, at Straffordville, Calton, Springfield, Orwell, Sparta, St. Thomas, Fingal, Lawrence Station, Iona, Dutton, West Lorne and Rodney. In Kent, at Ridgetown, Thamesville, Bothwell, Dresden, Wallaceburg, Eberts, Dover township hall, Raleigh township Union hall, Valetta, Wheatly and Blenheim. In Middlesex, at Newbury, Glencoe, Appin, Napier, Delaware, Strathroy, Adelaide Village, Parkhill, Ailsa Craig, Nairn, Coldstream, Lucan, Ilderton, St. John, Lambeth, Thorndale, Dorchester Station and Harrietsville. In Oxford, at Tilsonburg, Brownsville, Otterville, Norwich, Burgessville, Oxford Centre, Sweaburg, Ingersoll, Thamesford, Embro, Woodstock, Innerkip, Drumbo and Tavistock. In Perth, at the separate school house, Gore of Downie, St. Marys, Avonton, Kirkton, Staffa, Fullerton, Mitchell, Bornholm, Rostock, Amulree, Milverton, Atwood, Listowel and Gowanstown. In Waterloo, at Linwood, Wellesley, Elmira, Winterbourne, Bloomingdale, Berlin, New Hamburg, New Dundee, Ayr, Galt, Hespeler and Doon. In Wellington, at Aberfoyle, Arkell, Morden, Guelph, Rockwood, Oustic, Erin, Hillsburg, Belwood, Fergus, Elora, Alma, Arthur, Drayton, Glen Allen, Moorefield, Palmerston, Harriston and Clifford, finishing on the 15th December; 154 meetings altogether.

Cream was supplied and butter made at all these meetings except four, and at these I talked on the care and management of the milk and cream, and explained as best I could our method of work. Samples of milk have been tested at nearly all the meetings, the largest number in any one day being at Erin, where sixty tests were made. In all, 1,685 samples were tested during the season, mostly whole milk, but a few samples of skim-milk and butter-milk were also tested, and if the samples of the two latter that have been brought to us this summer are an average of the skimming and churning the people generally are doing, between a quarter and a third of the butter is being thrown away in the butter-milk and skim-milk. In fact, if the farmer had only four or five cows and had a Babcock tester, and used it and followed its teachings intelligently, the saving on this item alone would pay for two or three testers in a year. The test for whole milk has ranged from 1.4 per cent. to 16 per cent. fat, but I would not guarantee the correctness of the samples. One sample that we tested read 2.5 per cent. fat, and a second sample from the same cow, tested a few days later, after giving special instructions as to how it should be taken, read the same. The highest test, from a sample the

correctness of which I had a chance of verifying, read 9 per cent. fat. This was from a cow that had been milking about eleven months, and was giving a small quantity of milk. From the fact that it was difficult to tell if the sample was correctly taken, and also impossible to find out how long the cows had been milking, it was a very difficult thing, indeed to form any opinion as to the average.

The meetings on the whole were very well attended, and very much interest has been taken in them. The attendance ranged from 14 to over 400, the average being from 60 to 75. Welland, Monck, West Elgin, South Perth, and Centre and West Wellington greeted us with the largest audiences, taking all the meetings held in each county into consideration. Our meetings were very small during the month of July, as the haying and fall wheat harvest was calling for every energy from the farmers, and it was impossible for them to attend. I think another year it would be advisable to drop out a few weeks at this time, as even those who wish to attend cannot do so at such a busy season of the year.

The majority of the meetings were held in halls in the various places. Some few were held in the open air, and a few on fair grounds, but I think these latter should be discontinued as far as possible. It may be a good thing for the fair, but people are out for amusement, and do not care to listen to a practical talk of 1½ to 2 hours in length. The most of the meetings were held at 2 o'clock in the afternoon, a few, however, in the evening.

The method of conducting the meetings was as follows: When the meeting was called to order I generally began by making a few introductory remarks about our work, and Mr. Hume started with the churn. Proceeding, I called attention to the work at various stages in the manipulation of the churn, as the occasion arose; referred briefly to the advantages of dairying, and to the dairy cow, but dwelt more particularly upon the care of milk, cream and making of butter, everything as far as possible being illustrated from the practical work in operation. A circular, "Hints on Butter-making," of which the following is a copy, was distributed at each meeting:

HINTS ON BUTTER-MAKING.

Cleanliness Important. In order to insure success in butter-making it is necessary that great cleanliness should be observed. The cow should be kept clean, the food should be clean, the stable must be clean, the milk, cream, pails, strainer, churn, worker—in fact everything about the dairy, including the person or persons working in it, should be a model of cleanliness. Cleanliness and intelligence are two requisites for successful butter-making.

The Cow. Keep none but good cows, each of which will make at least 250 pounds of butter in a year. Feed the cows that you have liberally, house comfortably, care for kindly, and milk regularly. Give pure water only, and keep salt where it can be reached by the cows at all times. Having done all this, dispose of those that do not attain the standard.

Utensils. Procure proper utensils, because with the best there is a great deal of labor in making butter. Among them be sure to include a good dairy thermometer. (A glass one preferred). The following is a list of most of the articles required in an ordinary farm dairy, together with their probable cost:

A barrel or box churn, size to suit herd	$ 6 00 to $ 11 00
A lever or roller worker	6 00 to 9 00
A butter mould—size, one to two pounds	1 50 to 3 00
A shipping box, with ice box in center and wooden trays	4 75 to 6 00
A thermometer (glass)	0 20 to 0 50
A salt sieve (hair)	1 00 to 1 50
A pair of scales, to weigh quarter ounces	5 00 to 10 00
A butter-milk strainer—size, 2 to 4 quarts—with perforated tin bottom	0 25 to 0 50
A butter ladle	0 25 to 0 50
A cream pail (tin, with handles on sides and tin stirring spoon)	1 00 to 2 00
Creamer cans and box for cold water (8 cows)	5 00 to 40 00
A hand cream separator (10 or more cows)	100 00 to 125 00
A stiff brush for cleansing utensils	0 20 to 0 30
A supply of washing soda or borax	
A supply of good butter salt, per sack	0 70 to 2 00
Butter color, if thought advisable to use it, per bottle	0 25 to 1 00
or per gallon	3 50

Milk House. A dry, cool cellar of uniform temperature, free from bad smells or smell of vegetables, is a very good place in which to keep milk. Milk or butter, when kept for any length of time where such smells exist, quickly becomes tainted and lessened in value. A milk house with double walls may be constructed quite cheaply. A pantry or a cupboard is not the best place in which to keep milk.

Milking. Milk only where the air is pure; brush the cow's udder before commencing; milk rapidly and quietly; strain immediately, and get to the place of setting or separating as soon as possible.

Setting. Set the milk while it is warm. Set in creamers or deep pails. These are better than shallow pans, especially in summer. Put the cans in water at from 40 to 45 degrees—keep it at that temperature—and skim at the end of 12 hours in summer and 24 hours in winter. A water tight box about two feet deep will be a convenient place in which to put the pails where a creamer is not used. Cans may be used which are either put wholly under the water or set in water which is as high as the milk in the can.

If shallow pans are used, skim at the end of 24 hours in summer and 36 in winter, and always before the milk becomes sour and thick. Keep the temperature of the milk room even at from 50 to 60 degrees. A hand cream separator will pay with a herd of 10 or more cows.

The Cream. The cream should be kept sweet until 24 hours before churning by keeping it cool, either in the creamer box or in a cool cellar. Get a cream vessel (tin is preferable) large enough to hold the cream for a whole churning. If there is not sufficient for a churning from one skimming, stir the cream thoroughly at every addition of fresh cream.

In summer warm the cream to 63 or 65 degrees, 24 hours before you wish to churn and it will be about the right degree of sourness or ripeness in that time, but as soon as it becomes slightly thickened and sour churn it. It is not advisable to allow the cream to become warmer than 63 degrees in warm weather. In winter the ripening temperature will be from 64 to 70 degrees. In case the cream does not sour properly in 24 hours, it is a good plan to add a small quantity (about 2 per cent.) of sour milk or sour cream to act as a starter.

All changes in cream should be effected gradually. Never add hot or very cold water directly to the cream to warm or cool it. To effect this set the cream vessel in another vessel containing warm or cold water, and stir the cream all the time it is being warmed or cooled. Do not allow the milk or cream to freeze. If the butter is white a small amount of good butter color may be added to the cream, just before commencing to churn.

Churning. Strain the cream into the churn and you will not be troubled with "white specks." Use a churn without paddles or dashers on the inside. Churn often in the summer, not less than twice a week. In winter do not churn less than once a week. The churning temperature for summer will be from 56 to 60 degrees, and in winter 64 to 68 degrees. Everyone must find out for himself what is the best temperature. Start the churn slowly (50 turns to the minute, increasing to 60 or 70 after a few minutes) and if a close covered churn such as the "Daisy" be used, it will be necessary to remove the plug at the bottom of the churn two or three times during the first ten minutes. When the butter "breaks" add one quart of cold water (if the day is hot, and warmer water—55 to 60 degrees—if it is colder) to the churn for every pailful of cream, and then continue churning until the butter is about the size of grains of wheat, when the churn should be stopped, the butter-milk drawn off and as much water added as there was cream at the commencement. Give the churn a few rapid turns and draw off this water; repeat the operation, when the water should come away quite clear. If it is not, then a third washing may be given to the granular butter.

Never "gather" the butter in a solid mass, as this method leaves too much butter-milk in the butter. It also makes the "even salting," so requisite in good butter, more difficult to perform.

Salting. Fine salt at the rate of from ½ ounce to 1 ounce to the pound of butter may now be sprinkled on the granular butter in the churn; or the butter may be salted by means of brine put on the butter while in the churn; or the granular butter may be removed to a cool room and placed on a slanting table which has butter cloth spread on it, and there salted and allowed to drain for three or four hours, or over night. Afterwards work very slightly and pack or print at once if for immediate use. Or the granular butter may be removed from the churn as soon as washed and drained, placed on the worker, salted and printed at once, or be packed in tubs or crocks for market.

Working. Be careful not to overwork the butter, injuring the grain and making grease of it. Work by pressure and not by friction. A slanting worker with a movable roller or with a lever attached at one end will be found to lessen the labor, and is much preferable to the bowl and ladle.

Marketing. Put up in a neat and attractive form, and get it to the consumer as quickly as possible. If it is thought better to do so, it may be packed solidly in tubs or crocks and covered with butter cloth, or parchment paper and salt-plaster so as to exclude the air. To this salt-covering, fresh brine should be added from time to time.

To prepare ash or spruce tubs to be filled with butter, they should be soaked with brine for one or two days, afterwards rinsed, scalded, and have salt sprinkled on the inside before packing in the butter. Tin-lined butter tubs are used by a number of butter-makers.

The final work of the meeting was the explanation of the Babcock test, and the testing of the samples of milk brought to us.

All the utensils for handling the butter were put to soak in cold water a few hours before the time of meeting, to prevent the butter from sticking to them. When the cream came it was tested immediately, as regards temperature and acidity, and warmed or cooled as required to bring it to the temperature at which we desired to churn. When we first started out in May the temperature for churning was about 63° to 64° ; then we gradually lowered it till during June and July the temperature ranged from 57° to 62° ; fresh cream at the higher temperature to churn in a short time; ripe cream at about 60°, and sour cream lower, depending on the acidity. The latter part of August and during September we churned at 61° to 62° ; October, 63° to 64° ; November, 64° to 67° ; December, 67° to 70°, and over, for ripened cream and other stages, higher or lower as required. Our average time of churning was about 20 minutes, and only eight times longer than half an hour, and then not quite an hour, except in two or three instances when the the cream foamed in the churn. We made from 1½ to 15½ lb. butter at the meetings, and from 5 to 15 lb. from three gallons of cream. Mr. Hume occasionally did the work, from the time the cream was put in the churn till everything was washed up, in one hour. In every instance we got the butter out in the granular form upon the worker, but during the hot weather this could not have been done without ice.

The butter when put up in neat squares or oblong prints, and wrapped in parchment paper, reminded very many people of soap, it looked so neat and shop-like ; but I pointed out that most of the soap-makers put up their soap much more attractively than some of the butter-makers put up their butter. They had studied the art of pleasing the eye, and it was time the butter-makers were studying the same point.

In travelling around the country from place to place as we have been this summer, we have had an opportunity of learning many things with regard to what the people are doing and what they are not doing in this dairy business. The counties of Wentworth, Lincoln and Welland we find are well fitted for making a success of dairy farming ; but it has not been developed. Grain-growing and selling out the farms by the bushel has kept many with their noses on the grindstone, but a few have awakened to the fact that the crops are getting smaller year by year ; they see that something must be done, and are looking to dairying as the hoped-for remedy, and not without success. But it takes considerable to move some people. The great majority cannot see any money in cows, and I am quite sure they are right, as three parts of them do not put enough intelligent thought into the production, care and feed of their cows to make anything out of them. It would do some of those people a world of good to transport them to such a fine dairy district as we found in some parts of Oxford county, where they might feast their eyes on some good cows, and also on their owners' account with the factory, as well as with their banker.

Monck and Haldimand are in many places well fitted for dairying, but in others there is a scarcity of water, and the artesian wells are nearly all sulphurous. A few cheese factories have been started, though so few cows are kept by each patron that neither they nor the maker receive all the profit that might follow from an increase in dairy stock.

In Brant county we found an intelligent people who have gone into fattening cattle, and have made a success of it. However, the dairy business has not been neglected, a few cheese factories being in operation. They are giving good satisfaction to the patrons, though laboring under the disadvantage of having a small supply of milk.

In Norfolk and Elgin we found a fine district, but a great variety of soil, very much of it light or loamy. It is a soil eminently adopted for dairying, and yet the majority have followed the ruinous policy of grain-growing and selling off those farms that which should have been fed. We found them also committing another crime against their farms, as well as their pockets, and Kent county is also a transgressor on this point, and that is

raising young stock till it is two or three years old, weighing from 900 to 1,100 pounds, then selling the animal at from $20 to $35 each. I want now to tell those people what we promised them we would: We found in Middlesex county some eager buyers for those steers, and they calculated to clear from $10 to $15 on each animal, besides enriching the soil by feeding all the grain they grow, as well as some grown elsewhere. You have built the most costly part of the animal, and why not get a good price for your grain by building the most profitable part; that is, fatten or finish the animal. We found that the dairy business had received some attention, but butter-making was mostly in private dairies. A few cheese factories have been started, some of which have collapsed, due to lack of faith on the part of many of the patrons, either in the dairy industry or in each other. Others have held their ground and are growing in favor; but such instances as a man sending 70 lb. of milk per day to the factory from seven cows; or a factory with 145 patrons with nine teams on the road and receiving only 10,000 lb. of milk in the flush of the season, show that there is yet much room for improvement. Those seven cows would be wonderfully helped by a little green fodder, such as peas and oats, or green corn, and so would their owners' pockets. In fact we found that those who are making the most out of their cows, and who are best satisfied with the dairy business are those who exercise a little forethought and grow some soiling crop to tide their cows over the dry time. Those, therefore, who say that they cannot afford the time to feed this green fodder, even if they did grow it, are talking nonsense, as the facts are all the other way.

Those southern counties are also eminently adapted for corn growing, even the M. S. S. coming to maturity. With a soil easily worked, what a heritage those people have if they would only waken up to their possibilities, and direct their energies aright into the building of good dairy herds to turn their genial climate into glittering gold.

Kent county, with its rich bottom land, a county almost without a stone, and as level as the western prairies, where nature has not provided rivers, but the energy of the people has made them—here we found friendly and energetic people. But nature has seemed almost too indulgent; there appeared to be no exhausting such rich and fertile soil. But a few illustrations point to danger ahead Continuous cropping is removing the humus from the soil; the plow is yearly turning up bigger and harder lumps; the soil is rebelling against the loss of its virgin fertility and pointing out to man the necessity of restoring the same by converting all the grain and fodder grown into animal products, and getting the manure out on the land as soon as possible.

In Middlesex and Oxford counties we found a stranger mixture of progressiveness and the reverse. Here we found some of the finest and wealthiest districts we have visited; some of the greatest points in the west for the shipping of export cattle; some of the greatest milk-producing and cheese-making districts; but here we also found districts utterly indifferent to the making of good butter; utterly indifferent to the fact that every pound of butter they made added to or deducted from our reputation as a butter-making country. Even loyalty to our country should demand that we make the finest article of product, and the finest only. Through the work of dairy missionaries from abroad, as well as of progressive dairymen in their midst, a great many have "figured down" to the fact that a cow has to milk longer than seven to eight months to pay for her feed, and so cheese factories are being started to run as creameries in the winter with eminent satisfaction to the patrons, as the cows even surprise their owners as regards their capabilities for work in the winter, when well fed and cared for.

In Perth county we found an inquiring people, which is a very good sign indeed. The soil and the plentiful supply of good water makes the place well fitted for dairying, and cheese and butter-making are receiving considerable attention in some parts. It is acknowledged by all that those townships that have made a specialty of dairying are the wealthiest in the county, and yet how much of truth it takes to convict some people. They will acknowledge that these things are so and yet fold their hands in helpless indifference, instead of bestirring themselves with intelligent energy and starting along the same road to prosperity.

Waterloo and Wellington counties are directing their energies along the line of mixed farming, with a leaning toward the fatening of cattle for export. But the dry, rolling land, the plentiful supply of good water, and the limestone formation which, with

the intelligence of the people, has given this district such a reputation for good cattle, would also if applied to the dairy business add very much to the income of the farmers. Quality is what the market demands, and here we have conditions well fitted to give it.

In conclusion, I would put down a few practical thoughts deduced from my observations during the season's work.

One hundred and fifty churnings, from May 1st to December 17th, of all kinds of cream, in all sorts of conditions, has shown me that there is no necessity for any person churning longer than a half to three-quarters of an hour. Carelessness or ignorance causes nine-tenths of the longer churning.

It would seem, not from what people say, but from what they are doing, that many persons kept cows for the fun of it, or because some other person kept cows. In 1,685 tests made, only five or six persons could tell definitely how much milk their cows were giving in a day, let alone in a year. Such indifference to business methods in farm work and the consequent ignorance of what the individual factors of the farm are doing, has very much to do with the unsatisfactory position of many farmers.

One-half the cows of the country are living off the farmer, instead of the farmer off them, and an account opened with the butcher for the carcasses of the same would add materially to the wealth of their owners.

Respectfully submitted,

F. B. Linfield.

MISCELLANEOUS MATTER.

Visitors to the Dairy.

During the past year we have had a great number of visitors. Some dairymen in the neighborhood also have come in and spent a part of the day with us to see how we manage the cream and butter. During the month of June, when hundreds of farmers and others visited the institution, we usually arranged to have a separator and Babcock tester in operation, also a churning. We found the raised platform, with chairs, which commands a full view of the working dairy, very convenient, except that for times of excursions it is not nearly large enough. While the work was progressing an address was given on the objects of the department and the requisites of a dairy, together with a full explanation of the process of butter-making from a farmer's standpoint.

"Black Pepsin" in Churning.

Many readers have doubtless seen the article in the press which states that 150 per cent. more butter may be made by adding a substance called black pepsin to the cream. We sent to the Concord Chemical Company, New York, for a sample of the wonderful stuff, and received in a few days a small sample of a reddish-looking powder, accompanied by a printed letter and two circulars. The letter stated that the directions, or recipe, are copyrighted by Cloud, Harlin & Co, of Toronto, Canada, and cost $30 per hundred, and retail at $2.50 each. We wrote Cloud, Harlin & Co. (?) Nov. 4th, requesting further particulars and more of the pepsin, saying we wished to give the matter the fullest investigation. Our letters were returned, stamped by the P. O. Department as follows: Supposed to be of a fraudulent character.' One of the circulars is headed in the following manner:

A FORTUNE FOR FARMERS.

AND A GREAT CHANCE FOR AGENTS TO MAKE MONEY. CANNOT $32 A DAY BE EASILY MADE?

Here are a few of the sentences:

"What could be more desirable for the farmer than to know how to double the yield of butter without additional expense or labor? Will not every person that makes butter pay $2.50 for directions and the right to use them as soon as they see that the yield of butter can be more than doubled by the use of black

pepsin as directed ? If as much butter can be made from five cows by using black pepsin as from ten cows without its use, can any person that keeps cows afford to be without it ? " etc., etc.

"The trouble with most people is that they won't try, and consequently they *can't expect to succeed. Don't be afraid to try. Don't hesitate. Don't wait. Go to work*, and when you have accumulated a fortune you will point with *pride* to the time you *acted for yourself.*"

"All we ask you to do is to get some directions, and *try our business one day.* We have never yet had a person try our business who did not succeed *better* than they expected. Remember the price of directions is $30 per hundred, or 15 directions for $5, or $2.50 for a single direction. Black pepsin is worth $2.50 per box, and a box will make 500 lb. of butter ; a dozen boxes are worth $24.

Address, CLOUD, HARLIN & Co.,
Toronto, Canada."

The above is a sample of the whole circular.

November 7th we took 8.5 lb. of cream, testing 15.4 per cent. of fat, and containing 1.31 lb. of fat, which would make about 1½ lb. of butter. The cream was treated according to directions. When finished, we had 3½ lb. of butter, or no increase after deducting the two pounds of melted butter, which was added in accordance with the directions given. The butter-milk contained 0.9 of one per cent. of fat. November 12th we divided equally 18 lb. of cream, which tested 17.4 per cent. of fat. One-half was churned in the usual way, and the other half was treated with melted butter and black pepsin. Result, from pepsin cream there was 1½ lb. of butter, after deducting two pounds of melted butter. The butter-milk contained 1.6 per cent. of fat. The other lot gave 2¼ lb. of finished butter, and the butter-milk contained 0.4 of one per cent. of fat. There thus was no increase whatever in these two experiments, while the extra labor involved was considerable. I may say that in the second experiment we added 6 lb. of skim-milk to the cream, thinking that possibly this might help, as they say the more skim-milk the better. The quality of the butter from the pepsin lot is inferior

As there have been several inquiries in reference to black pepsin, from druggists and others, I would advise persons to spend their money in something more profitable than buying a compound that will only delude.

As a matter of fact, no compound can increase the yield of butter 150 per cent. It is possible that a substance may incorporate more of the solids of milk than is obtained by making butter, but such a compound would not be butter, but something that more nearly resembles cheese.

The following is given as the average composition of milk : Water, 87 ; fat, 3.6 ; albumen, 0.7 ; casein, 3.3 ; sugar, 4.7 ; and ash, 0.7 per cent. There is thus 13 per cent. of solid matter in milk. In butter-making we want but one of the solid constituents, and as little as possible of the others. It has an average composition of, fat, 84 ; water, 11 ; salt, 3 ; and curd, 2 per cent. In cheese-making, we make use of more of the solids. A Cheddar cheese consists of, water, 31 ; fat, 31 ; curd, 31 ; sugar, etc , 3 ; and ash, 4 per cent. We may discover a new method of manufacturing cow's milk, but the product will not be either butter or cheese, but possibly lacto-solidine. If such a compound can be made wholesome for food, and made from cow's milk, all dairymen will welcome it as a new feature of this already great agricultural industry, dairying.

This is not the first time that a compound which claimed to materially increase the quantity of butter that could be made from a given amount of milk has been brought to the attention of the public. A few years ago, what is known as the "Gilt-edge Compound" was investigated by a chemist at the Department of Agriculture at Washington. Tests showed it to contain pepsin, and the butter made with it contained about 40 per cent. of water, while it was apparently merchantable butter. This was truly a fraud on the consumer.

To show how eagerly some people will bite at anything of this nature, one of the leading druggists of Guelph tells me that he has had a number of inquiries for black pepsin. He informed them that it was a fraud, and advised them not to waste any money on such stuff. How long, oh ! how long, will it take some persons to think and act sensibly ? One would expect that hayforks, hulless oats, marvellous fruits, and rich, fast butter ought soon to teach people that there is but one way to prosperity. This way is characterized by three things : think, act, work.

Butter-Making on the Farm in Summer.

Many enquiries have recently been received by this department as to printed matter dealing with butter-making, which shows that there is a desire for something of that nature. To aid the overworked farmers' wives and daughters in the difficulties which constantly arise in the handling and care of milk and cream, and also in the churning of the butter, we thought that we could not do better than to give a simple outline of how our dairy at Guelph is managed in the summer time. We might here say, however, that we think it would be far better for our butter-making industry if the manufacture of the butter were done more largely in creameries or factories as in the case of cheese. The chief advantages of such a system are, a more uniformly good quality of produce and a lessening of labor at the farm.

Our dairy herd at the present time numbers fourteen cows, twelve of which are now giving milk. We are raising eight calves, which are fed chiefly on warm, sweet skim-milk containing a little oil cake. Each calf has a small box in which dry oatmeal and oil cake are placed, and which they soon learn to eat with a relish. Some cut grass fed in the stable completes their ration.

In the Stable. At present the cows are at pasture. Night and morning they are brought into the stable to be milked, and are fed a small quantity of bran—about one pound a day. At the side of each manger is a small box, which is kept full of salt, and in front of each animal is a water trough, where they may obtain drink at will. Before commencing to milk the *men* wash their hands, for which purpose we keep a wash-basin, soap and towel in the stable. Milking begins at five o'clock morning and evening. Each cow's udder is well brushed before commencing to milk, and the milking is done as quickly and quietly as possible. As soon as the cow is milked her milk is weighed, and the weight recorded on a sheet. (Twice a week, morning and evening, each cow's milk is tested for the per cent. of fat or butter therein.) The milk is then strained into shot gun cans through a gauze strainer having three or four thicknesses of butter cloth fastened on the under side by means of a tin ring, which slips over the rim on the bottom of the strainer, thus securely fastening the cloth, and making an almost perfect strainer. The milk is removed from the stable to the dairy as quickly as possible after it is milked, and again strained before it is run through the cream separator. When all the cows are milked they are taken to the pasture. The stable is thoroughly cleaned out after each milking and the floor sprinkled with land plaster, the windows and doors being kept open as much as possible to give the stable a good airing.

Later in the season when the pastures begin to dry up we shall feed to each cow *in the stable* from twenty to thirty pounds a day of green peas and oats, of which we have about three-quarters of an acre growing vigorously at the present time. Later we shall feed about the same quantity of green tares and oats, of which we have about an acre and a-quarter, sown ten or twelve days after the peas and oats. Later still we shall feed green corn, of which we have about two acres. We are thus prepared for a dry season if it comes, and if we do not require these to feed in summer they will be cured and kept for the winter.

In the Dairy. We have been using a Laval "Baby" separator, No. 2 (hand power), for over a year, and like it very much. Recently we have purchased an Alexandra No. 8, and it is giving good satisfaction. It is a cheaper machine than the Laval. Our method of using is as follows: After the speed of the bowl has been attained the tap is opened from the supply can, and the warm milk allowed to flow into the machine. *It is very important to attain the normal speed of the machine before allowing any milk to flow into the bowl.* Some have had trouble from lack of care in this particular. When the last of the whole milk is out of the supply can we run about a gallon of skim-milk through, and lastly about the same amount of warm water, to clean the cream out of the bowl. The cream is then cooled down to about 45° Fahrenheit, the machine and all utensils thoroughly washed, and the dairy made neat and tidy—as every dairy should be. The skim-milk is then taken back to the stable for the calves, and the cream put into the cream pail and kept cool until twenty-four hours before we wish to

churn. (I may say that I think a preferable plan would be to have a neat, clean room in or near the stable, where the separator might be set, and when separated the cream could be taken to the dairy or cellar, while the skim-milk would be where it is wanted for feeding.) The cream is kept in one large (ten gallon) tin can, which has a *tin* spoon in it for stirring at every addition of fresh cream, and also for stirring when the cream is either cooled or warmed.

Sometimes the milk is set in deep cans or creamers, in cold or ice water. When this is done the milk is put in the cans while warm, and cooled to at least 45° Fahrenheit before skimming, which is usually done at the end of twelve hours. After skimming the cream is handled in the same way as from the separator, except that it is not cooled, it being already cold enough.

Those who still use the small shallow pan should set where the air is pure, the temperature even (fifty to sixty degrees), and skim always before the milk becomes thick. Do not be afraid to take off some skim-milk along with the cream.

CHURNING. We churn three times a week—Monday, Wednesday and Saturday. The night before we churn the cream is warmed to about 65° by setting the cream can in another vessel containing water at about 90° to 100°. We use a large can, but a wash-tub will answer the purpose very well. The cream is kept stirred until it gets to the proper temperature, when it is either placed in a "Boyd Ripening Vat," or set in a room where the temperature is about the same as the cream. The next afternoon the churning is done, but when the weather becomes very warm we shall churn in the morning while it is cool. The cream will also be set to ripen earlier if necessary. This matter of ripening or souring of the cream is a very important one in preparing butter for the present market, and to get a profitable yield of butter. The only rule that I can give at present as to when the cream is ripe or sour enough is that as soon at it gets about as thick as good maple syrup, tastes slightly sour, and has begun to separate into small particles it is ready to churn, and we then churn it without allowing it to stand any longer.

Our average temperature for churning during summer is 58°—ranging one or two degrees higher or lower according to circumstances. The cream is brought to this temperature in a manner similar to preparing it for ripening; it is then weighed and strained through a perforated tin strainer into the churn. The cream can is then rinsed out with a little water. For every ten pounds of cream we add one dram (about half a teaspoonful) of Hansen's or Yorkshire butter color. This is done before starting the churn, and for the purpose of imparting a "June grass color" to the butter.

The churn we use is a No. 5 "Daisy." Two or three times during the first ten minutes of churning the plug at the bottom is removed to allow the gas to escape. Churning usually occupies from fifteen to twenty minutes—seldom over half an hour. The churn revolves at the rate of sixty or seventy turns to the minute. As soon as the butter "breaks," which we can tell by the swishing sound, or by the clearing of the glass in the cover, we add a quart or two of water for each pailful of cream, the temperature of the water varying with the day and the condition of the cream. On a warm day one can scarcely have the water too cold, as it will then chill the particles of butter and make them firm, while at the same time the water dilutes the butter-milk, allowing a more perfect separation of the butter. The churning then continues until the butter granules are about the size of grains of wheat or a little smaller, when the churn is stopped, the butter milk drawn off from below and strained through the strainer previously mentioned for the cream. This strainer serves to catch any particles of butter which may come out with the butter-milk; but if the separation has been complete the butter will float on the top and none appear in the butter-milk until the very last. We next add cold water or weak brine in quantity sufficient to float the butter and wash out the butter-milk. We usually half fill the churn with water, give it a few rapid turns, and draw off the milky water. The operation is repeated with pure cold water, which generally comes away clear. If it is not clear, water is added the third time. The butter is then allowed to drain in the churn for fifteen minutes or half an hour, and sometimes the salt is added while still in the churn; but as a rule the butter is removed from the churn, placed in a butter-tub and weighed. It is then spread upon a V-shaped worker that slants towards the front and

has a lever fastened at the lower end. Fine salt at the rate of one ounce for each pound of butter as it comes from the churn is now sifted on by means of a hair sieve. After sifting on about half of it the butter and salt are gently stirred, when the rest of the salt is added, and the butter worked by means of the lever. We work sufficiently to remove the excess of water, to thoroughly incorporate the salt in every particle of butter, thus preventing "streaks," and making a firm, compact body. The butter is then put up in pound prints made by means of Carver's butter mould, or a mould made by Moyer & Son, Toronto. These may be gauged so as to print a pound quite accurately, and their use saves a great deal of labor. Each print is then wrapped in parchment butter paper—one sheet wrapping a pound. On these sheets is printed, in such a way that when folded the words appear on the top of each block, the following, which serves as an advertisement:

FRESH BUTTER.

MADE AND PUT UP BY THE

EXPERIMENTAL DAIRY,

GUELPH.

We never had enough at one churning to make a shipment, so the blocks of butter are put in a box. The box is made of wood, containing four *wooden* trays, with an opening down the centre in which is placed a tin vessel filled with ice, and the whole is kept in a cool room until the box is full, when it is taken to a commission merchant in the city of Guelph.

There are perhaps fifty ways of making good butter, and I do not claim that ours is the best. There are scarcely two persons that pursue exactly the same method in all the details, but I think the plan here outlined will, if carried out in any dairy, give butter that no one need be ashamed to have a buyer examine.

THINGS WE DO NOT DO.

1. We do not consider that we know everything about butter-making, as something new is being discovered every month. Not only from our own work are we continually learning, but also from the observation and research of others.

2. We do not keep a cow that makes less than 200 pounds of butter in a year;

3. Nor put the dry cow on a starvation ration;

4. Nor expect a cow to make something out of nothing;

5. Nor keep our cows in an ice-house, hog-pen or dungeon;

6. Nor allow them to go a whole year without carding or brushing them;

7. Nor depend upon pasture alone for a supply of summer feed.

8. We do not allow the milk to stand very long in the stable to absorb foul odors.

9. We do not neglect to strain the milk at once after milking;

10. Nor set the milk in deep cans in well water without changing the water at least twice, or without ice;

11. Nor mix sweet cream with cream to be churned less than twelve hours before churning. (The cream is ripened in one vessel which holds the cream for a whole churning);

12. Nor add scalding water to the cream; nor guess at the temperature with the finger; nor take two or three hours to churn;

13. Nor gather the butter until the "dasher stands on top," and then dip it out of the buttermilk;

14. Nor add coarse salt by guess; nor work the butter into grease.

15. And finally, we do not send our butter to market wrapped in old rags that may have seen other service in the home.

THOUGHTS FOR THE WINTER DAIRYMAN.

THE STABLE. The stable should be made snug and comfortable before the cows are brought in permanently. If any boards are off they should be tacked neatly on again. If the hinges are broken have them repaired, as it will save much time and trouble during the winter. Ventilate the stable—not by means of cracks in the side, where cold winds may enter, but by means of a box leading from the floor above to the roof. This is specially necessary in basement stables. If the floors are leaking repair them at once. The liquid manure is worth a great deal more per ton than is the solid, yet in many stables it is lost, and at the same time it is injurious to the health of the animals to have it beneath the floors. We use constantly on our floors a liberal quantity of land plaster or gypsum, which has three effects :

(1) It fixes the ammonia, and makes the manure more valuable.

(2) It sweetens the stable, absorbing bad odors.

(3) It gives the stable a better appearance, and looks neat and tidy. In fact, an hour after our cows are turned out you would scarcely know that a cow had been in. This is accomplished by a liberal use of plaster and whitewash. Both are cheap.

If you can possibly arrange it so as to have water in the stable, you will find that it will pay a handsome profit on the money invested.

FEED. If feed is likely to be scarce, it will be better to sell a portion of the stock and feed the remainder well. Better keep five cows well fed than ten poorly fed ; there is no profit in the latter method. Where there is no ensilage provided, it will pay to feed some roots. They give tone to the system, and provide that succulency which seems so beneficial in milk production. Turnips should be fed after milking, to prevent taste in the butter. In feeding ensilage, we have found that it is not wise to feed this alone in large quantities, as the acid, which all ensilage contains more or less of, seems to have a deleterious effect on the digestive apparatus. Some bulky food, such as hay or straw will be found valuable.

Cows. Half the herd should be freshly calved for the winter dairy. This will produce a better article of butter than if the milk of strippers only be used. They should be fed liberally. Try two or three pounds of oil cake per day to each cow for a while, and note the result ; pea and oatmeal are also useful. Our standard ration last winter was :

Ensilage	50 lb. (25 lb. morning and night).
Hay	6 lb. (uncut), fed at noon).
Bran	5 lb. (mixed with ensilage).

Towards spring we substituted for a portion of the bran two pounds of pea and oatmeal, mixed in equal proportions. Do not forget the dry cows. If they are to milk well next season, they must not be starved and exercised too much this winter. The best cows, only, pay. Others are kept at a loss. Find out which are the best cows, and keep them.

DAIRY. If living near a cheese factory or creamery, induce the proprietor to run all the season if possible. It will pay better than private butter-making, unless you have special customers. This will relieve the "women" of a great deal of hard labor. If it must be manufactured at home, provide suitable utensils for making butter with, and also a proper place in which to keep milk and butter. For obtaining the cream from ten or more *good* cows, I would recommend the use of a separator, as more butter will likely be obtained, and the skim-milk will be in the best condition for feeding. For churning, a box or a barrel churn without dasher or paddle will give best results. Calculate exactly the size of churn that will be required, and then get it one size larger. Do not fill over half full. Be careful the creamer milk does not freeze. Use a dairy thermometer, and churn at the proper temperature to obtain butter in twenty to forty minutes. Sixty-five to seventy degrees will be about right for cold weather, if the cream is properly ripened. Keep the

butter in the granular condition until salted ; then work once with a lever worker, which will save a great deal of wrist work and wry faces. Put up in neat pound packages for market. A butter mould that prints a pound in less time than you can think about making one by hand may be purchased for $1.50, or be made by a "jack-knife carpenter." Parchment butter paper may be bought at the rate of seven sheets (each sheet will wrap a pound) for a cent, and it is cheaper than old rags, old window curtains, or any cast-off garments. Better to give the latter to the poor, whom you have with you always, than to send your butter to market in them and become poor yourself because of poor judgment in satisfying a market overstocked with poor goods Put your name or brand on each pound of butter, that consumers may know whose butter they are buying and eating. If it be first-class, you will soon have a greater demand than you can supply. This is the best means of advertising your business that I know of, and does not cost much either. Market regularly, and as soon as possible after milking.

Building a Dairy. In case you cannot afford to build a special house for the abode of the aristocratic dairy family, see that they are not compelled to live in the same part of the cellar with low-caste turnips, potatoes, and those occupants with bad-smelling breaths, viz., the onions. Nor yet should they abide in a pantry or cupboard along with pickles, cinnamon, nutmeg, or any of these highly-perfumed fellows.

If milk is to be kept in the cellar, keep it clean and sweet. Have a room partitioned off from the rest. If it is to be kept in the house, set apart a room airy, well-ventilated, and kept for dairy products only.

Where a suitable place may be obtained in or near the stable, and sufficient cows are kept to warrant the expense, a separator at the *barn*, run by tread power, will prove economical. The advantages of this method are :

(1) Cream only is carried to the dairy, while the skim-milk is at the place where it is required for feeding. This lessons the labor.

(2) The bull or an idle horse may be used to do the work, and this lessens expenses. Result, more profit.

(3) The separating may proceed while the milking is going on without any one specially to look after it. With a quiet animal on the tread this part may proceed without any special attention, while a supply of new milk and the reception of the skim-milk and cream may be attended to by the milkers. By the time the milking is done the cream will be ready to take to the dairy or house, and the skim-milk be ready for feeding. This may sound Utopian, but we are preparing to do this in our new dairy barn, and will report results later.

Select a site suitable for *good drainage*, and conveniently located. Excavate 2½ to 3 feet below the surface. Have a stone wall come to the top of the ground. Posts or a balloon frame of such a height as to make the ceiling ten feet high may be set on the wall. For the outside sheeting, building paper, on which planed lumber is put up and down, with battens, will be found to do well and give good satisfaction. For the inside, put on building paper and matched lumber. An ordinary roof will suffice, the ceiling being finished with paper and matched lumber. The floor may be made of cement. Windows and doors should be double.

We have a floor in our dairy made in the following manner, which has proved a success so far : After levelling, a coat of three or four inches of broken stone was well rammed into the ground, and then it was levelled with Georgetown cement, in the proportion of four parts of coarse sand to one of cement. The finishing coats were made by using cement and sand in the proportion of one to two. I think, however, that the plan given below, which is taken from Bulletin 18, Iowa Experiment Station, will prove more satisfactory, although it is probably more expensive.

The floors of all the work rooms are made of cement, after the following manner : They were reduced to grade, then covered with fine sand, so as to gain as even a surface as possible. On this surface was spread a slushing of domestic cement (presumably, home manufacture) to a depth of four inches ; the cement being mixed in the proportion of one to four, with coarse, unsifted sand. The spreading was done in sections with a common hoe, each section being levelled with a straight edge. After this coat was

thoroughly dry, one of German cement, one-half inch thick, was thoroughly spread with a trowel. Immediately following this, another half-inch coat was applied, and dressed repeatedly as the cement set. The first half-inch coat was mixed one to one with medium fine, sharp sand. The second was also mixed one to one with sand, and about one-sixteenth part of yellow ochre added to the mixture. The ochre increases the plastic condition and improves the color. The color may be further improved by mixing a little red ochre and cement together, wetting it to the consistency of paint; then sprinkle over the fresh-laid cement, and use the trowel sufficiently to give it a cloud-like appearance. The finishing coats should be laid wet enough so that water will rise to the surface of the cement while being dressed. Then the repeated trowelling works out all the air, gives a polished finish, and there is no risks of cracks by reason of shrinkage or uneven settling. This finished coat must be laid in alternate sections of two feet in width.

The cost of laying cement in the above manner is about ten cents per square foot. A barrel of cement, when mixed one to one with sand, will lay nine square yards one inch thick.

The essentials for successful winter dairying are good cows, good stables, proper utensils, and a place for keeping milk, cream and butter where the air is pure, and where they will not freeze; and above all it is required that there should be the right kind of a man or woman to manage the business—one who will see that everything is done at the right time, at the right place, and in the right manner.

Bacteria in the Dairy.

Bacteria. What are they? They are not a new breed of cows. They are not a new kind of cheese. Bacteria are organisms which do a great deal of good, and also a great deal of harm. When these first began to be studied, "it was not agreed what place should be assigned to this new form of life. Some saw in it a fungus without a mycelium; others looked upon it as one of the algæ. . . . It is now, therefore, very generally admitted that ferments (bacteria) are fungi." (Low Forms of Plant Life.) (Schutzenberger).

For a long time there were a great many changes going on in different materials which scientists were unable to explain. The bread "rose" when yeast was added. Why, we did not know. The cider turned into vinegar. Why, we did not know. The barley and rye when properly treated made beer and whiskey. Why, we did not know. The milk went sour. Why, we did not know. A number of persons were attacked with typhoid fever or diphtheria at the same time. Why, we did not know. Now we know that the cause of all these phenomena, and a great many more, are due to what are known as bacteria—invisible organisms that are all around us.

Bacteria of Milk. When milk is first drawn from a healthy cow it is almost free from bacteria, but when allowed to stand for a while they increase marvellously. Milk which has stood for some time contains a great deal of bacteria, which produce changes resulting in var ous forms of abnormal milk. L. Adametz divides the bacteria commonly found in milk into three classes, according to their effects. The first class changes the sugar of milk into a syrupy acid, soluble in water. The name given to this acid is lactic or milk acid. It has the effect of coagulating or curdling the milk. This is the most common form of bacteria in milk, and is both the friend and foe of the dairyman. If allowed to work just so long in milk and curd for cheese-making, they are a great help to the cheese-maker; but if they get the start of him, the result is poor cheese. They also assist the butter-maker in producing a fine-flavored butter; but if allowed to develop too much, the cream spoils or decays, and the butter soon goes off flavor and becomes rancid.

The second class produces a curdling of the milk by the formation of a rennet-like ferment (not by acid), and the curdling of the milk is soon followed by a solution of the curd. There would seem to be too distinct ferments produced by this second class of bacteria. One like rennet curdles the milk, and another similar to trypsin (found in the pancreatic juice), or pepsin (found in the gastric juice of the stomach), appears to have the power of peptonizing (rendering soluble) the casein or curd. This latter is considered to be of great importance in the ripening or curing of cheese. As we are all aware, a

cheese properly made improves in digestibility and palatability with age, and the explanation of this fact is doubtless found in the action of these ferments on the matters present. Cavities in cheese are sometimes produced by bacteria, which decompose the milk sugar, and possibly some of the albuminous matter, producing gases which fill the cavities

A third class appear to have no visible effect. They grow in the milk, but produce no very marked changes.

The ultimate sources of bacteria, according to this authority, are the earth, the air, or water. They get into milk from five different sources :

(1) From the hands of the milker while milking.
(2) From the air of the stable, which is always well supplied with germs.
(3) From milk vessels not properly cleaned.
(4) From water used to dilute milk.
(5) From diseased animals, especially where the udder is affected with any contagious disease.

Milk is an excellent nourishing medium in which bacteria of all kinds may develop, as they require nitrogenous matter for their growth. Numerous cases of typhoid fever, diphtheria, cholera, and similar diseases, have been traced to milk which has been diluted with water containing these germs of disease. Some species cause what are known as ptomaines (poisons) in milk or cheese. A number of instances are on record where persons have been poisoned by eating milk and cheese containing this poison.

"Impurities in the Wurzburg Market; Milk, and the Source of the Bacteria in Milk." L. Schulz (Arch. Hygiene, 14 (1892), pp. 260-271).

The author determined the amount of sediment in a number of samples of milk, and studied the origin of the bacteria in milk. In these latter studies the first and last portions of a milking of a cow and a goat were compared as to the bacteria content. The teats and udder of the animal, and the hands of the milker, were thoroughly washed with water and with corrosive sublimate solution, previous to milking. About 200 c.c. of the milk drawn first, and of the strippings, were each caught in sterilized flasks; the latter were closed with plugs of cotton. immediately placed on ice, and taken to the laboratory for testing by means of plate cultures.

The following results show the average number of germs per 1 c.c. of milk :

Cow's milk ..	First portion	55,566
	Last "	Sterile
Goat's milk ..	First portion	50,836
	Last "	Sterile

In a second series of tests no sublimate solution was used for washing, but water was used freely. The average number of germs per 1 c.c. of milk was :

Cow's milk ..	First portion	97,240
	Last "	500
	Middle "	2,590
Goat's milk ...	First portion	78,718
	Last "	665

The author believes the following conclusions to be warranted : The enormous germ-content of milk is not, as was previously supposed, due entirely to lack of cleanliness, but is partially accounted for by germs working up into the opening in the end of the teat, where, under the favorable temperature, they increase rapidly between the milkings, growing upon traces of milk adhering to the outlet. They are largely washed out in the first portion of milk drawn, which accounts for the higher germ content of this portion. As milking progresses the number of organisms in the milk naturally decreases, until the strippings may be sterile, as was found in the first tests made, though this is not believed to be the rule. (Experiment Station Record, September, 1892.)

Bacteria of Cream. To give an idea of the number of these organisms that would be contained in an ordinary churning, Prof. Conn estimates that in some of the specimens studied by him, there were from 200,000 to 2,000,000 in a single drop of cream the size of a pin head.

On the inside of the bowl of a cream separator there is always found at the end of the separation a considerable amount of slimy material ; the more milk that has been run through without cleaning the bowl, the more slime will be present ; and he (Prof. Conn) found that this slime contained the greater number of bacteria, the cream next, and the skim-milk next. He found in ripened cream at least fifty different species or varieties of organisms, including bacteria, yeasts, and moulds. "In cream there is a great battle of the forms with each other. The victors will be those which chance to get the best start."

Having, then, so many different agents at work in the cream, it is no wonder that we find great difficulty in having cream ripened evenly at all times. In fact, it is almost impossible to get cream ripened uniformly, even under seemingly uniform conditions. By the use of proper cultures (breeds) taken from good cream and buttermilk it has been found possible to eliminate undesirable qualities in the butter ; and in cases where these have been used, improvement in the quality of the butter has been very noticeable. Some manufacturers have already begun to advertise "pure bred acid-producing bacteria." It is possible that a new live stock industry may spring up in the near future, breeding "thoroughbred" bacteria for use in the dairy, which will guarantee uniform butter and cheese.

Already John Boyd, of Chicago, has patented a process of ripening cream by the use of a ferment or starter made from fresh skim-milk, which, he claims, will give very uniform results in butter-making. We have used the process to some extent in the College dairy, and are quite well pleased with it. (For full particulars see College Report, 1891, dairy department.)

The characteristics of ripened cream are :

(1) Sourness due to the formation of lactic acid by the acid class of organisms.

(2) Thickening due to a more or less complete precipitation of the casein caused by the acid.

(3) A characteristic odor due to a mixture of the volatile products of bacteria growth.

(4) An aroma or flavor due to the same cause. I think, however, that food has something to do with the flavor of butter and cheese. In those districts where coarse grasses and ill-smelling weeds abound, the flavor of dairy products is not nearly so good as in those places where a variety of fine-flavored grasses may be found in the pastures. Other cases might be cited where food has a marked influence on the flavor of dairy products.

Bacteria of Butter. Lafar found the number of live germs per grain in samples of fresh creamery butter to range from ten to twenty millions, and about twenty times as many germs were found in samples taken from the surface as in those taken from the inner portions of the material. In packing butter to keep some time, it is necessary to pack solidly and cover with something that will exclude the air which contains these germs. The use of saltpetre, sugar, and borax mixed with salt, forming a plaster with which to cover the tub or crock, is commended. The reason that these act favorably in this connection is that they are antiseptics or germ destroyers.

Cold has also the effect of decreasing the number of germs in butter. A sample kept on ice by Lafar showed a marked decrease in the number during the first week, but after that there was no loss, showing that cold destroyed some species while others are not affected. The addition of ten per cent. of salt was not sufficient to destroy all the germs. Heat kills a great many of them, but some varieties are able to resist a very high temperature. Not only does natural butter contain these germs, but artificial butter also has a great number of them. Other bacteriologists (Heim and Laser) have found

that cholera, fever and tuberculosis germs retain their vitality in butter fat long enough to make infection with these diseases through butter possible.

We are thus surrounded by invisible friends and foes. To obtain the help of the former and to combat the latter, it is very necessary that we understand the peculiar circumstances or conditions under which they thrive best; and knowing these we are able, to a certain extent, to get all the good possible out of them, and to check as much evil as possible which is liable to emanate from them.

Temperature and Cleanliness are the two most important things which affect bacteria. They all thrive best at a certain temperature, most of them at from 30° to 40° C., although some do best at a lower (the one causing bitterness in milk or cream) and some at a higher temperature. We know that milk sours more quickly at a temperature of from 90° to 100° F. As we increase or decrease the temperature from this range the milk will keep sweet for a longer time, other things being equal. Thus we know that milk will keep sweet longer if we cool it down to 40° F. than at a higher temperature; while if we raise it to 150° or 160° F., it will also keep for a longer time. Why? Because temperature has a marked effect on these organisms. We also know that among filth contagious diseases revel. Tainted milk and infection are most likely to come from a dairy where uncleanliness prevails.

Your obedient servant,

H. H. DEAN,
Professor of Dairying.

FOURTEENTH ANNUAL REPORT

OF THE

ONTARIO AGRICULTURAL AND EXPERIMENTAL UNION.

The fourteenth annual meeting of the Ontario Agricultural and Experimental Union was held at the Agricultural College, Guelph, on December 22nd and 23rd, 1892, commencing at 10 a.m. on the 22nd.

The President, NELSON MONTEITH, B.S.A., Stratford, Ont., occupied the chair. The minutes of the last meeting were read and approved.

REPORTS OF COMMITTEES.

Agriculture. Mr. C. A. ZAVITZ: I may say, as Secretary, that we have had a very successful year, on the whole. During the year 1892 we have increased our work to a large extent, and have sent out about 6,000 packages of seeds and fertilizers. In 1891 we sent out about 2,500; so you can see that the work during the past year has increased very largely. As we have a long report which comes on to-morrow forenoon, I think it is not necessary to speak at greater length at this time. I may say that the expense of agricultural experiments during the year was about $300.

Horticulture. E. LICK: On behalf of the Horticultural Committee I may say that we have a report to be presented this afternoon; and while it may not be quite so complete as last season's, yet considering the weather this year, I think will be fairly satisfactory. I do not know exactly the expenditure, but it will be somewhere about $35.

Dairying. Prof. DEAN said that the committee on dairying did not do anything definite during the past year.

Live Stock. D. BUCHANAN: I was one of those appointed on this committee; and as you will understand, our work was to undertake experiments in any matter relating to live stock. It is very difficult to carry this on by individuals engaged in farming, as almost any line whatever in which live stock is concerned must be carried on at considerable expense. So the committee has found it impossible at the present stage of the Union to do anything in this work.

Prof. SHAW: I do not want you to go away with the impression that nothing has been done because the matter has gone by default. Such is not the case. The committee that was appointed to consider this matter did consider it, and the conclusion arrived at was that there were so many difficulties in the way of carrying on co-operative experiments in the feeding of live stock it was not advisable to undertake it at the present time. Whether it will ever be done, I am not in a position to say.

Apiculture. R. F. HOLTERMANN: The Apiculture Committee has this year taken up the question of foul brood—the vitality of the germ, etc.; and I may say that as far as the work of the committee itself is concerned, all that we have been able to do was to secure the services of Mr. J. J. Mackenzie, of the Provincial Board of Health, who is a very thorough man in that line; and the committee has supplied him with all the necessary material in that direction. We thought it would be desirable for the Union to have the credit of this work as we had started it, but if the Union had not continued the investigation, then the Government would have taken it up. The latter part of our work was hindered a little on account of the threatened cholera invasion, and Dr. Bryce had to be away, and that made Mr. Mackenzie very busy; and on that account there was a certain amount of work which we would like to have accomplished last year but we were unable to do so. I may say that the results which have been obtained are very satisfactory.

REPORT OF CORRESPONDING SECRETARY.

Mr. President and Gentlemen: During the past season the Executive met at Toronto, and we decided that the better way would be to hold our meeting at this time of the year. We thought it would give a better chance to prepare the report for the year, and it would not interfere so much with the work of the students at the College. We also thought that at that time we would be able to secure reduced rates independent of the number who would be with us. In regard to the reduced rates we were disappointed, as you all know. As soon as I found that we would not get the holiday rates, I at once wrote to the district secretaries, informing them of this. I also wrote to the President of the College and Mr. Zavitz, asking them to inform those present at the institution, so that they might inform their friends.

In getting up the programme we of course understood that we had plenty of ability amongst the graduates of the institution who could very well take part in the programme, and carry it out satisfactory, but we thought it would be to our own interest to try and get some outside talent—men who are making special efforts to develop special lines. You will be very much pleased to know that we are going to have Prof. Bailey, the Minister of Agriculture, Prof. Shutt, and other prominent men, with us.

We sent out a circular asking the ex-students to co-operate more with us, and also asked them for their membership fee. As a result I have already heard from about twenty-five, and no doubt we will hear from a great many more.

PRESIDENT'S ADDRESS.

Gentlemen: With the experience and lessons of another year we are permitted at this Christmas season to gather at this the fourteenth annual meeting of the Ontario Agricultural and Experimental Union. As an officer of this Association, and fellow-student with you in agriculture, I heartily welcome you to this meeting, and would invite you to join in a full discussion of the various questions arising from the subjects which may be here introduced. We desire our meeting to be of the greatest possible good to the greatest number, and with this in view we would ask you to be concise in your remarks. I shall not occupy your valuable time in explaining the object for which our meeting has been convened. This is already familiar to you. The extension of our Union work during the past year has been especially gratifying. With our Alma Mater as a common centre, the beneficent influence of experiment has radiated, until to-day data will be forthcoming from almost every township in the province. Never was there a time when agriculturists seemed more alive to the necessity of increased knowledge in their business. Is this a time that we should lag? Let us rather redouble our efforts,

and show the practical usefulness of the work in which we are engaged. Year by year the sphere of our operations has increased, until within the past year the number of individual experiments carried on throughout Ontario aggregated almost six thousand. The rapid increase in the number of outside experiments is a sure indication of the increasing interest and confidence placed in the value of our work. The results from the extended and successive experiments so carefully conducted should act as finger-boards pointing the farmer to that crop or fertilizer which is most likely to give profitable results in his locality. This might possibly lead to specialties, varied by conditions which I believe to be the ultimate destiny of successful agriculture. To-day we find among farmers a lack of that thoroughness so essential to success, which is largely due to the present system of mixed farming. The words of Pope are indeed applicable.

"One science only will one genius fit,
So vast is art, so narrow human wit."

Our Association is but yet in its infancy. We look for still greater and grander results in the years to come, and that this may be accomplished we must be loyal to our Union, and strive for greater excellence through the medium of perseverance and accuracy in our experiments. In the growth of fodder crops our operations might be largely extended, whereby we may wrest from the sun, air and mother earth the greatest amount of energy, to be in turn moulded into beef or other animal products, for which our Province has become deservedly far-famed.

There are forms beneath our farms we know not of. Instead of increasing the number of our acres let us rather increase the productiveness of those we already possess. The opportunity for development in this direction is only limited by our knowledge and industry.

It has been customary with my predecessors in office to make some reference to our College paper, the *O. A. C. Review*. I hope you will pardon me if I digress somewhat from the ordinary line in speaking upon this subject. I have a very friendly feeling for the *Review*, and am pleased to note the ardor with which each successive editorial staff enters upon its duties, and the determination to make its year's publication superior to all previous ones. The present editorial staff is to be commended in its laudable efforts to convey to every ex-student a reflex of modern college life, with its increased attractions. I shall not comment upon the relation which should exist between the *Review* and the Union, except to say that the Union should help the *Review* and the *Review* help the Union. Our interests are largely mutual.

In conclusion, I have to thank you for the honor conferred upon me by electing me to the presidency of this Association during the past year. I have also to thank you for the staff of fellow-officers who have so ably wrought out the design and purpose of our Experimental Union.

QUESTION DRAWER.

Q. Is the Babcock test likely to come into general practice in the private dairies of Ontario?

Mr. W. J. Palmer: In answer to that question I would say that it may be some time before the farmers generally through Ontario will adopt the Babcock test on the farms. I think, however, it will come to that in the end. It is a test that requires a certain amount of care, and some are afraid of handling the sulphuric acid. I think the associates who go out and adopt dairy farming to any extent would certainly find it pay them to get a Babcock tester and use it wisely. I think there is nothing that requires more attention from the dairy farmers of Ontario, especially of eastern Ontario, than the using of some test on the farm to weed out the poor cows.

Mr. John Hannah: I perhaps can do nothing better than repeat the words of Mr. Palmer regarding the Babcock tester. I do not know that we will see it in general use

for some time, but certainly any person who intends to follow dairy farming should use a Babcock tester. They can be had for a very small amount, perhaps $6 or $8, and the expense for acid is the only other outlay, and that is practically next to nothing. However, if one man does not care to go to this expense, let three or four combine and get a tester amongst them and follow out the test week by week. In a very short time they would know exactly what their cows were doing—whether it was profitable to keep them or not. I think the introduction of the Babcock tester is one of the greatest advances that has been made in this century. Any ordinary dairyman who has skill enough to set a can of milk has skill enough to work the Babcock tester.

Mr. S. P. Brown: I purchased a tester last spring, and I find that it is of great value to anyone who is handling milk. I found by using it that in our herd we have two or three cows which it is very necessary to exterminate as soon as possible, and I think it would be one of the best means of advancing the dairy industry that there is. We should extend its use as widely as we can.

Q. Is it a good practice to feed roots to breeding ewes before lambing?

Mr. D. Buchanan: It is not that I have had any practical experience myself, but I attended the meeting of the Sheep Breeders' Association, held in the city here, and there was an article read by Mr. H. Arkell in favor of feeding roots to breeding ewes. The President, Mr. J. C. Snell, was of the opinion that it is not well to feed roots to breeding ewes. Mr. McGillivray had fed roots and found that there were no injurious results from feeding them. The opinion of that meeting was slightly in favor of feeding roots to breeding ewes.

Mr. J. Burns: I have not had very much experience in feeding roots to sheep, from the fact that I do not keep a very large flock of sheep, but I always make a practice of feeding them a few roots—I could not tell how many—but I make no difference as to whether it is lambing time or not, and I find no injurious results from doing so.

Prof. Shuttleworth: Did Mr. Arkell discuss the quantity of roots fed towards lambing time? It seems to me that it would not be advisable to feed the same quantity near the lambing season as earlier in the season. I have heard farmers express that opinion.

Mr. Buchanan: Some think that the roots are the cause of the weakness of the lambs. Mr. Arkell said it was not due to the feeding of roots at all. He might have qualified his statements by saying that he made a difference in the quantity for one or two days before lambing, but not more.

Prof. Shaw: I am not very sure that my own personal experience will be of much value in this matter, but I had some experience which was not very favorable to it some years ago. I grew a very good crop of turnips one year, and we fed roots to the ewes very freely, with the result that when the lambs were dropped we noticed they were unusually large and deficient in vitality; and in consequence a good many of them died, but I am not just prepared to say that that condition of the lambs resulted from the feeding of roots—it is possible that it did not. I may say that other experienced breeders have observed the same thing; but on the other hand, I have met with some feeders, and feeders who have been very successful, who are prepared to say that in their judgment they think there is no danger in feeding roots very freely to breeding ewes, providing they are fed under certain conditions. Those who take that view have been particularly careful in the way in which the roots are fed, that is to say, they have not given them to the ewes early in the morning. When they do it has a tendency to chill the animal, and possibly the difficulty has arisen to some extent in that way. Their practice is to feed about the middle of the forenoon about half the amount given in the day, and again in the middle of the afternoon the other portion; so that the roots are fed when the animals are the least hungry, and they seem to think that this practice is favorable because the roots have a less tendency to chill the ewes. I was astonished at the amounts that some of these men had fed—seven and eight pounds per head per day to breeding ewes, yet they say that the lambs have come in fine form. At present the whole question is not quite cleared up. With the present knowledge that I possess, I would be inclined to advise to feed roots with some caution; but I am not prepared to say that they should not be fed at all.

Q. How much meal should a steer receive daily when being fattened for the block?

Prof. SHAW: If I live long enough, I hope to be able to tell you that between ten and twenty years hence. I may say, however, that we have done something in that line here, but our experiments thus far have not led to any very conclusive results. We have been in the habit of feeding about from ten to twelve pounds per head per day, but the idea seems to prevail latterly that feeding that amount is too much. Of course there are very many conditions on which the amounts of feed to be fed are dependent. The breed probably would have something to do with it, the age of the animal, the way in which it had been fed previously, and the qualities which it possesses would also affect the amount of meal that should be fed. I may say, however, that we are carrying on an experiment that has principally that object in view this winter. Of course we can say nothing as yet as to what the results will be, but we look upon it as a very important line of experiment, and we hope to continue it till some definite results are arrived at, but it will probably take a long time before we get anything of very much value in reference to so wide a question as that.

Q. What are the best modes of fattening swine to supply the market of the present day?

Prof. SHAW: I am sorry to have to say that we have not done more in that line in the past. Those of you who are acquainted with the circumstances will know that we have been somewhat hampered in that respect on account of room. That difficulty is now to be removed, however. I may say that the most of the experiments that we have conducted in regard to feeding swine in the past have related to the feeding of certain mixtures of meal along with roots, in the one case, and ensilage in the other, and sometimes feeding the meal unground, and at other times ground. We find that a mixture of meal, as a general thing, without very much of the other adjuncts gives the best results. In that respect, so far as our experiments have gone, they do not seem to be quite in touch with some experiments that have been conducted in several of the American stations. In some of these experiments they lay considerable stress upon the feeding of green food along with certain proportions of meal. We did not get sufficient encouragement in our test to justify us in giving much attention to that course, but I should say here by way of explanation, lest a wrong idea should be carried away, that no doubt the age of the pigs had considerable to do with the results. We generally commenced when the pigs were perhaps from three to five months old, as the case may be, and we fed a pretty large amount of green food, sometimes ensilage, sometimes turnips and mangels, and sometimes, when in the proper season, green food that was cut and mixed with the meal; and I must say that so far as my personal ideas were concerned in regard to what the results would be that I was somewhat disappointed. The trend of the experiment pointed simply the direction, that the mixture of certain kinds of meal fed pure gave on the whole about the best results. The favorite mixture with us in the past has been this: equal proportions of ground barley, ground peas, and ground oats. Of course, as I have said before, our experience is somewhat limited, but we have experimented enough in that line to feel quite justified in recommending that as a good ration for the Canadian farmers to use in feeding pigs, for these can all be freely grown in this country. We found considerable advantage from grinding the grain. Allowing a reasonable cost for grinding the grain, we found that that cost was not only returned in the extra gain that the animals made, but that there was also a profit in addition.

Q. Can superphosphate be profitably used by the Ontario farmer?

Mr. C. A. ZAVITZ: It might be profitable on some farms, and it might not be profitable on other farms to use superphosphate. There are some crops that it would be useful for. I might say that the work of the Experimental Union in that line, which I consider is now the best authority on the practical application of fertilizers in Canada which we have, is that it will not pay the average farmer to use superphosphate upon grain crops. That has been the experience of the Experimental Union

during the last five or six years, during which time there were perhaps 125 experiments carried on by the members of the Union. Do not understand me that in all instances superphosphate will not make a profit upon the outlay. In some instances there have been large profits resulting from the use of superphosphate. Much depends upon the quality of the soil and the manures it has received before. This is the real value of the Union, to determine upon which farms it will give good results and upon which it will not.

Q. What breed of poultry is best for the farmers?

The PRESIDENT: I have had some experience, and would favor the Plymouth Rock.

Mr. HOLTERMANN: I have taken some interest in poultry lately, and am in favor of the Plymouth Rock. Some whom I have written to are of the same opinion also.

Prof. SHAW: Why do you favor them?

Mr. HOLTERMANN: They mature fairly early, commence laying early, are good birds to kill, fairly good to lay, their eggs are of a good size, and the color is such as to please the public generally. I regard them as a general purpose bird.

Mr. GRAHAM: Are they not given to setting two-thirds of the time?

Mr. HOLTERMANN: Hardly two-thirds. The Leghorns have been favorites up to the present time, but I think it is the general opinion that they are no good for killing; and a bird that is only good for laying is not a desirable bird.

Mr. GRAHAM: Would you favor the dark Plymouth Rock?

Mr. HOLTERMANN: Yes; I know very little about the white.

Mr. GRAHAM: If you kill the dark during the time they are moulting, their pin-feathers, which are black, will show, whereas with the white Plymouth Rocks they do not show very much. I might say that I was at a poultry show in Brantford about a week ago, and I was asking a great many about the Plymouth Rocks, and they seemed to think that they wanted to set too much for the average farmer, but what other breed they favored I could not find out. I never tried the Plymouth Rocks but once, and they wanted to set too much for me. They were all right for a time, but would set nearly all summer. I find from experience that there are other breeds which you can get to lay earlier in the winter than the Plymouth Rocks will. I tried the Leghorns. The Langshans gave better success with me than any other. A great many favor the light Brahma for winter laying. The difficulty with the Leghorns is that you require a very warm place for them in winter.

Mr. HOLTERMANN: What appeared to be the general opinion as to the best bird?

Mr. GRAHAM: You could not get that out of them. There were a number of breeders who had bred nearly every variety. Mr. Daniels, of Toronto, I believe, has had every variety of fowl there is, but he did not favor the Plymouth Rocks at all. He was more inclined to favor the Java, and I might say that the majority were in favor of the Light Brahma. They claimed that if you do not feed the Light Brahmas too heavily they will lay the most of all the breeds.

REGISTER FOR EX-STUDENTS.

The following report was read by G. F. Marsh, B.S.A., *Farmers' Advocate*, London, Ont.: The work upon which I am to give a report is the establishment of a register of all the ex-students, giving their occupation and place of residence. This question was brought up at the Union meeting last year, and it was decided that we should start a register, and the Personal Editor of the O. A. C. *Review* should compile the report. We

consulted with President Mills, who offered to bear any expense in connection with it. We sent postcards to all students since 1874. Some responded at once, others were longer in answering, and some have moved away and we have not been able to find them. Quite a number however neglected to return the cards, and a great many are to be heard from yet. I only wish that my report was more satisfactory ; but when you consider that it is some eighteen years since the College started, you will understand that it would be very difficult to get information regarding them all.

We talk about the sun never setting on the British dominions, but we may say that the sun never sets on the College dominions. I am very glad to say, however, that the students as a body are in Ontario. Of those who came before 1886, there are about two-thirds of them farming, and half of them are farming in Ontario. I think that is a good showing, considering that a great number of them did not come from farms ; and of those who came since that time, three-quarters are farming, and two thirds are in Ontario.

I would recommend that the register be printed and distributed. If not, I think it should be printed, and let the students buy it. By that means it would be scattered all over.

Prof. SHAW : I was particularly interested in the report of Mr. Marsh in reference to the gathering of the names of the ex-students for that registry. It is one of the many important things that this Union has undertaken ; and I think if the information which has thus been gathered is properly used, it will be found to be one of the most important. I think so for this reason : you all know that the reproach has been brought against this institution from all sides that the College was not educating men to go back upon the farms. We had no data whereby we could answer that charge, but I am glad to say that we have data now.

OUR PUBLIC ROADS.

The following paper was read by Mr. JOHN BURNS, of Kirkton : That the condition of the common road has much to do with the prosperity of both town and country ; that it enriches the farmer and raises him socially, commercially and financially ; that it widens his influence, contributes to the happiness of his family and brings him in touch with all the improving and civilizing influences of the busier world, there can be no manner of doubt.

We have in this country something like 2,000,000 of horses, above the age of two years, upon our farms, and at a moderate estimate of twenty-five cents as the cost of feed and care of each of these animals we see that the aggregate expense of maintaining them is about $500,000 per day. If by a similarly moderate estimate we say that they are kept in the stable in a condition of enforced idleness by the bad condition of the roads in spring and fall for a period averaging twenty days in each year, we may easily compute that the loss in this respect alone will amount to $10,000,000 per year, a sum sufficient to build, if properly expended, about 3,000 miles of excellent highway.

But of course there are so many conditions to be considered that it is impossible by any mathematical formula to compute the loss entailed upon any community by the continued toleration of these bad roads in their present condition. But it is certain that with the burden of extra help and extra draft animals, lost time, wear and tear of wagons and harness, the drawing of light loads and the depreciated value of farm lands, we are pursuing a short-sighted policy in permitting the present system to continue. Besides the actual loss, which a moment's reflection will serve to show, we are gaining nothing and saving nothing in that great department of agricultural industry to which the condition of our roads is of such marked importance. By dwellers in cities the actual condition of these country roads during the wet season is scarcely known. While with farmers, to whom all roads are bad roads and who have never seen or known of a highway better

than that which they have used from boyhood, these bad roads are an accepted fixture which long habit and use have impressed upon them as a natural and neccessary adjunct of farm life.

But aside from the social and political features of this question and the direct bearing which it has upon the personal income, expense and economy of the farmer, a bad road increases the first cost of produce—an increase which tends to enhance the price paid by every consumer, and this consideration, if no other, brings the road question home to everybody. During the period this fall when our roads were in their worst condition, the people of St. Mary's were paying fully thirty per cent. more than the market value for their wood and hay ; and this increase of price represents nothing to the farmer, who was practically shut out of the local market on account of the muddy roads. It simply represents an added profit of about thirty per cent. to the middleman or speculator, who following the unbending rule of supply and demand, trades upon the helplessness of the consumer in a market where he is unhampered by competition.

How long should this costly and paralyzing condition be permitted to continue ? Measured by every rule of economy, public and private, we are paying a heavy premium for keeping our roads in their present condition, and in labor and money we are spending more to carry on a system of shiftless maintenance than would be sufficient to keep in proper repair double the length of high-class roads under the methods pursued by England and other European states. In our struggle for road reform we are following in the footsteps and repeating the history of European nations, where in the beginning the same objections were urged, and the same obstacles interposed which we meet with at the present time.

Macaulay makes graphic reference to the difficulties of travel upon English country roads at a time when the English farmers indulged in the same periodical diversion of working out their road taxes that is provided for in our oldfashioned Ontario Statutes which we still keep in force for the maintenance of our own highways.

He states : Not so are the English roads of to-day. By experiment and by the better light of experience, the English people and their neighbors all over the European continent have learned that true economy in the construction and repair of the common roads, as in the construction and repair of the great railroads, consists in the scientific making and the systematic maintenance of these roads according to fixed rules and under the direction of an intelligent head.

In the perfection of this enlightened system it is probable that France leads the world. The government maintains a large body of trained engineers in its special department of roads and bridges to whom is entrusted the practical work of constructing and repairing the common roads. No part of the road system of France escapes attention, and every road is subdivided into sections varying in length according to its importance, each section being placed in charge of a man who is held responsible for the constant excellence of its condition. Referring to the economic worth of these roads to the French government, Mr. Francis B. Loomis commercial agent at St. Etienne, made a report to the United States Department of State within the last year.

Our conditions differing in some respects from those of the European nations I deem it wise to deal with the matter more from a local standpoint than from a general. And having said sufficient to convince anyone of the necessity of putting our roads in a state of greater efficiency, I will try and point out how I think it can possibly be done without increasing the cost very materially, and in order to do this it will be necessary for me to give you an illustration from which I can submit figures and draw comparisons. And to do this I will take the township of Blanshard, in which I live, as a typical one, convinced that what is here said in regard to this township will be applicable with slight variations from local circumstances to most of the townships of the Province. Generally speaking this township presents few difficulties in the way of road-making, it being traversed from north to south by the Thames, which has several small creeks running into it. This gives ample opportunity for drainage. Entirely within the limits of this township we have the town of St. Marys, which is the grain market for the surrounding neighbor

hood, which causes much heavy traffic over its roads. rendering it necessary to keep in good repair its main entrances. All the main roads of the township lead in the direction of the town. The side roads are little used and consequently need little attention. The main roads are those on which nearly all the expense occurs, and it is of these I will speak principally. All the roads of this township, with the exception of seventeen miles of company road that was built under the turnpike and toll-gate system, have been built and maintained by what is known as the statute labor system, a proceeding well known to you all, and which it would be superfluous for me to describe here. Although possessing some good features, this system is not the most suitable for the construction and maintenance of good roads and should give place to a better.

Perhaps it will be necessary for me here to make some reference to the way in which our roads have been constructed. Most of you have had some experience in building corduroy and grading. A width of about twenty feet was left in the middle of the road allowance, the earth on each side was loosened with a plow to the depth of six to nine inches and conveyed to the centre by scraper and shovel to a depth of from eight to twelve inches, and about eight feet wide. In places where the ground was high, no grading was done at all, the longitudinal slope being depended on to keep the surface dry. The traffic soon compressed the clay and pressed it down so that in the majority of cases it was only from two to five inches above the original level of the land ; and where no grading was done, the track became a depression, passable only in dry weather. On the other hand the narrow roadway was raised where the ground was low and wet to a height of fifteen to twenty inches, making a dangerous place for teams turning off when meeting. This is what was known as the clay, or more commonly and appropriately, as the mud road, for many years in use. On this, as a roadbed, pit-gravel was hauled and spread loosely to a depth of from eight to twelve inches, according to the fancy of the man doing the work. When the formation of the roadbed interfered with the natural course of the surface water, culverts were put in. These were usually built of logs with a plank covering but sometimes stone sides were built up without mortar, and a plank covering put on that. The defects of this condition of things are obvious. The superintendence of the work is placed in the hands of parties who have no training or experience in the best methods of work, who have given the matter no attention or consideration, and who are consequently unskilled and incompetent to make the best use of the time and money spent. No good road of any kind can be made and kept without a proper system of drainage, and this fundamental fact is almost entirely neglected by path-masters. In many places no side drains exist at all, and where they do exist they are always too shallow. In the wet weather of spring and fall, (the seasons when traffic is greatest) the roadbed becomes saturated and softened and unable to support the covering, and heavy wagons cut through the gravel and bring up the clay, mixing it with the covering, permanently ruining the road where it occurs and rendering reconstruction necessary the following summer. Too great a depth of gravel is put on at one time, and it is a long time before it is possible to go over it with a heavy load. In this condition the traffic seeks the side of the road when possible, cutting it and bringing the clay on the gravel. The gravel is taken from the nearest pit with no regard to its quality, and always contains too much clay or large stones to make a good road. The large stones are the worst as they cause ruts on either side from the concussion of the wheel as it drops over them. Wooden culverts are a constant source of danger being generally in a state of ill-repair. The foundations as a rule are not put deep enough, and the water soon undermines them allowing the walls to fall in, in which condition they are usually allowed to remain until some one complains, or the township becomes liable for an accident. Moreover they are not economical, decaying as they do so rapidly from the alternate wetting and drying to which they are subjected. The cost in this township for repairs to culverts alone, for the year 1889 amounted to almost $360, and this, without any road commissioners' salary, which if added would amount to almost another $100. This of course does not include a dollar spent for new ones.

To effect an improvement in these roads, thorough drainage is a prime necessity. This can be provided by an open drain on each side of the road, with slopes of one to one, and a width of one foot in the bottom. Culverts should be made to last as long as possible, and for this reason they should be built of stone where stone can be got so conveniently as it can

be here. It will always be found to repay the extra cost of construction by its solidity, permanency and consequent safety. The floor should be made of concrete to provide a bed that the water will not wash out, and render the cleaning out easier. The walls should be built on a solid foundation got by digging down to the solid clay, and should always go below the flooring, the mortar used should be made of cement, as it best resists the action of water. A culvert properly built will never need repairing, will be always perfectly safe and of no expense save for cleaning out once or twice a year.

In order that the road covering should be maintained so that extensive repairs will never be needed, minute repairs should be made to the surface systematically in small patches, as soon as ruts and depressions appear. The road should be constantly undergoing repairs. To have this done the road should be divided into lengths, on each of which an intelligent laborer should be placed, who thoroughly understands his business, to attend constantly to the condition of the road, and for which he should be held accountable. He should keep the ditches clean and in good order, and fill in the ruts as soon as they appear. To enable him to do this, gravel should be deposited in suitable places on the side of the road, one heap in each quarter of a mile. He should be furnished with a shovel, a wheelbarrow, a pickaxe, and a rammer. The new material should be added little by little, from time to time, in depressions and deficient places, and it should be broken fine in comparison with that used in the original construction. This patching should be done so constantly that it will never be necessary to add more than one to two inches in thickness at a time. It is one of the greatest mistakes in road making that can be committed, to lay on thick coats of material. A cubic yard nicely prepared and broken to a rod will be quite enough for a coat, and if accurately noticed, will be found to last as long as double the quantity put on unprepared, and in thick layers.

In speaking of keeping up the roads by constant patching Gilmore says : "This system of maintenance for roads of moderate traffic, seems open to the objection of being unnecessarily expensive, but observation and experience have fully demonstrated that such is not the case, and that the 'stitch in time' policy applies here with peculiar and significant force. It is not only cheaper to maintain such a highway in good condition for a given traffic adapted to it than to pay the extra expense of conducting the same traffic on a bad road, but it is also vastly cheaper to keep the road in excellent condition than it is to restore it to that state after a period of injurious neglect, during which it has become filled with deep ruts and thickly covered with dust and mud."

An eminent French engineer, who gave the matter an exhaustive and practical study, came to the conclusion that in proportion as the intervals between the periods of repairs were shortened upon roads of small traffic two important and valuable results followed : first, that the annual expense was *lessened*, and second, the roads were always in better condition ; and finally that the roads were never so good nor the expense of maintenance so small as when the system of unremitting and minute attention was in operation. The experience of these men I think would furnish sufficient argument in favor of putting our roads in a state of efficiency such as has been described. A thing which is manifestly impossible under our present system of administration.

The statute labor system was devised to meet the requirements of early settlements when a simultaneous opening of all the roads in a township was the thing most desirable. Its chief advantages were that under its working each ratepayer was permitted to do his share of the road building in his own immediate neighborhood, and that he was able to pay his road tax in labour rather than in money ; but these considerations (however important at first) have long since lost all their force. The portions of the road in which all are most interested now are those in the neighborhood of the town which are used in common by all. And the second consideration has come to be looked upon as a doubtful privilege as time is quite as valuable to the farmer on his property as on the road. Owing to the laxity of path-masters the time spent on the road is flagrantly misapplied. The day required is eight hours long, and any pretence of work is accepted. The impression is prevalent that in road work the time is to be put in with as little exertion as possible. The real amount of gravel hauled is never so great as reported on account of the smallness of wagon boxes and the desire of teamsters to save their horses. Anyone who has observed statute labor will agree with me that over one-third the time is wasted through

the trickery of workmen and the carelessness or ignorance of directors. As a proof of this statement I will give you one example : The township council pays thirty-five cents per cord for gravel, and counts five loads to the cord. Now by actual measurements, I find the average gravel box used is eight feet long, three feet one inch wide and ten inches deep, which if filled five times would hold 79 per cent. of a cord, showing a loss of 21 per cent. of a cord on every cord paid for, or a total loss of 21 per cent. of the money paid out, which in the last year of which I have any account would be 21 per cent. of $524 or a total of $110, and besides this the boxes were hardly ever filled.

I will now briefly suggest what I think would be an improvement. It seems to me that first of all it is absolutely necessary that we should have a thoroughly competent and responsible man as engineer or overseer, who would know how, when and where the work could be done to the best advantage, and that he should have the power, with the approval of the council, to purchase the necessary tools, keep the time of the workmen and be responsible for all the work left in his charge. He might also have the power to hire farmers and their teams to work on the roads who were willing to work according to the regulations which he might adopt. Another method which I think would give good results would be to abolish farmers' labor and do the work entirely by contract. I will give you a statement of the expenditure on the Blanshard roads for the year 1889, as taken from the auditor's report, together with a statement showing how I think a better result at a smaller cost is possible under a proper system of management. (The standard wages in each case being fixed by the council).

PRESENT SYSTEM.

2,757 days statute labor	$2,757 00
Contracts for gravelling	805 00
" " grading	238 00
Repairing culverts	358 00
Contracts for ditching	95 00
Other work on roads	6 00
Total	$4,259 00

CONTRACT SYSTEM.

Seven men for eight months, at $208	$1,456 00
Eight teams and drivers, five months at $260	2,080 00
Superintendence	800 00
Total cost	$4,136 00
Balance	$123 00

There you see gentlemen, with the time and money now spent on the roads of this small township, we could maintain a force of fifteen men and eight teams for a little over six months of the year and still leave a balance on hand to the credit of the new system.

But I very much fear it will be a difficult matter to accomplish much in the direction of a general adoption of this system unless legislation can be secured to assist in perfecting it, and I would suggest that the Provincial Government by legislative enactment, do at once two or three things in the direction of furthering this movement :

Procure and disseminate information by establishing a bureau where the facts relating to the expense, mechanical construction, care, durability, use and extent of the different kinds of roads shall be known and ascertained.

Then I would have some kind of government supervision, presided over by a competent engineer or by engineers appointed by the government, in aid of road making, and repairing upon scientific and economic principles, and I think it would also be to the

public advantage, if the state should own or control and maintain some through highways connecting the principal towns. They could in this way give a profitable example, and a strong incentive to the different municipalities to construct better contributory roads as feeders to the main ones. And it appears to me also that this would be a good investment for some of the rusty millions of surplus which is periodically reported as being in the hands of the Provincial Treasurer, and I trust that some influential body of our citizens may suggest it to the Premier so that he may have ample time to take it into his consideration.

Prof. SHAW: In reference to the paper that was given us by Mr. Burns, I am very much pleased with the principal portion of what he said, and do not know that I would be disposed to take exception to any part of it. The paper was evidently very thoughtful, and a great many ideas in it were new to me, but the great difficulty in connection with the road system seems to be, not so much to find fault with the method that is in vogue at present, but to devise a better one; and I was pleased to notice that Mr. Burns, if we may so speak, took the bull by the horns, in his paper, and ventured the suggestion of a better system. Whether that system would be the best or not, of course I am not prepared to say, with the little thought that I have given it. I was impressed with this statement, the advisability of putting on but a moderate quantity of gravel at once and having it put on oftener, and having any depressions in the road filled up at once. I believe there would be very great economy, indeed, not only in constructing roads in that way, but in keeping them in a good state of repair. Mr. Burns recommended that ditches should be made of a considerable depth. I do not know just how deep you would recommend them to be made, but I am not inclined to favor ditches that are very deep. They require of course to be deeper in some soils than in others. We should be satisfied with a moderate depth of ditch—just enough to give the road a proper inclination. One evil in connection with roads is a tendency to have them too narrow—to heap all the gravel within a narrow space, perhaps 8 or 10 feet, and have an elevation so that only one conveyance can go along the road at once. Mr. Burns took exception to putting too many and too coarse stones. This really tends to harm roads that would otherwise be good; and I am very pleased to think that we have been trying to remedy that so far as our roads in the neighborhood of this Farm are concerned. It is our practice to go out in the spring of the year and two men take each side of the road with iron rakes, and draw the stones that are loosened into the centre, and a fifth man comes along with a cart and draws the stones away. The consequence is that there are scarcely any stones left to inconvenience a person. Four young men will, as a rule go over five-eights of a mile in half a day; and when we think of the advantages in comparison with the small amount of work taken to do it, it is evidently the proper thing to do

Mr. HUNTER: I agree as far as I have heard in that paper with the method of constructing roads, but I am convinced that we cannot keep our roads in anything like a fair state of repair until we have a complete reformation in the rigs used, and the method that I would suggest is that the tires be broadened in proportion to the load that the rig is to carry. If you are going to drive to market with a load of from $1\frac{1}{2}$ to $2\frac{1}{2}$ tons with tires $1\frac{1}{2}$ inches wide, how can we keep the roads in repair? If loads like that had to be drawn on rigs with tires 4 inches wide, you can see that the effect on the road would be quite different. If the length of the axletree were altered so that instead of one wheel following the other it would run outside, you would get double the space of road for the load to occupy. Suppose the tires were 4 inches wide, and the axletrees made as suggested, we would have a space of 16 inches wide for the load to be pressing on, instead of three or four the other way.

Mr. LICK: We have used piping for culverts for the last nine years with success. We imported them from Ohio, and they have given unbounded satisfaction. We are now using sewer pipe—import some and get some from Hamilton. We have them as large as two feet in diameter, and they cost $1.75 a foot, and they grade down to about 12 inches. We thought that they would be damaged by frost, but we have had no evidence whatever that they are injured in any way by exposure. They require to be put in where there is considerable earth over them, that the wheels may not injure them.

Mr. HUNTER: Have you had any trouble in their choking with earth?

Mr. LICK: Not when the ditches are properly looked after.

S. P. BROWN: With reference to the width of the farm waggon wheels, I understood not a great while ago that there was an Act passed in 1885, requiring that all waggons, like farm waggons, etc., should have tires not less than 4 inches, and that Act was passed with a view to give five years for the use of the old waggons, and the Act really was to go into force in 1890, and since that I have never heard anything of it.

Hon. J. DRYDEN: That bill has been introduced in our Legislature two or three times, but has never gone through. The Legislature would rather leave it to the municipalities to decide themselves. The Act that you suggest has not been passed.

Mr. BURNS: I think it is a very great mistake to leave the matter with the municipalities themselves. One municipality might adopt that law and another might not, and it would not be convenient for a person who had a wide tire waggon when he got out into a township that used narrow tires; and unless the law can become a provincial law I do not think it would be of any assistance to the farmers at all. It has been proposed by some that farm waggons should be taxed, and in proportion to the width of the tire used. If a man used a six inch tire, tax him $1 a year; two inch tire, $6; and so on, for the use of it.

Hon. J. DRYDEN: I am greatly interested in this subject, and I would like to congratulate the writer of this excellent paper, for it contains a good deal which, when it is printed, will be of value in the discussion which is sure to take place on this road question. It is not a very easy question to settle, and I believe my friend here is the first person that I have met who, after finding fault with the present system, is prepared to suggest one that he thinks better. Many of the newspapers in discussing this subject say, "Take away the statute labor; it is of no use," but they leave you there and do not seem to know how to suggest anything as a remedy. It is not easy to do that. Mr. Burns does not like leaving this matter with the municipalities. He may be right, but all will see that if we are going to pass a general law we must have the support of the people, and members of the Legislature dare not go against the feelings of those who send them there. When they think that their constituents do not agree with a proposition of that kind, they prefer to leave the matter with the people themselves. That is safe enough if the people are educated to know the proper steps to take in the matter. I am free to endorse what Mr. Burns has said, that the present system is very faulty; but I do not agree with those who say all statute labor is done in an improper manner. I know sections where men have put in their full time, and were willing to put in a day or two extra to complete the job. The system of statute labor is not so very bad in theory; it is only so when you come to work it out in practice. Labor is entirely misdirected in a great many cases men take the work in charge who never studied road-making or thought about it, and put in their time with the rest without taking any further interest in it. Now, suppose we are going to change the whole system of road-making and do away with the statute labor, I point out to Mr. Burns that in a large majority of the municipalities it would be impossible to get any other labor than those who do the work now. You will find that when you come to put the new system in practice you will have to come back to the same labor that you are using now. Instead of having twenty-five path-masters in a municipality, you might have one, two or three according to the size of the municipality, men who have a salary, who would be expected to have some qualifications for the work —who would know how to repair or construct a new road, or put in a culvert etc. these men attempted to do their duty, with the same labor that we now have, they would no doubt, accomplish a great deal more than is accomplished at present. I am very glad that you discussed this road question, because I am here to listen, and ready to catch at any idea that is good. We cannot, however, always do what we want to do—we cannot go beyond public opinion. So that those who have advanced information of this kind must be prepared to educate the people to some extent in order to have it carried out. I was very much pleased with that part of the paper which made mention that you cannot have a good road without thorough and proper drainage. I believe that is the foundation principle of road-making. I can take you in my constituency to a road that goes down the side of a hill, that is very boggy and springy. It would have been utterly impossible

to have made a road there in the ordinary way. At the outset a drain was constructed right down the centre of the road-bed. I think it is a stone drain. That piece of road, constructed some 40 years ago, and on the worst portion of 20 miles in length of road, is the driest piece, I suppose, in the whole lot; it is always in order and dry. I have seen this plan tried elsewhere, and I believe one of the difficulties is the neglect of that principle. I have spoken to Prof. Shaw about the roads here, and have said I thought it would have been better if before they had started them they had put a tile drain in the bottom, or one on each side of the road. Another thing I want to endorse is what Mr. Burns stated, that the correct idea was not to pile such a large amount of gravel on the road at once.

It does not make the road any better to put on large stones. Even if they are no larger than your fist, when one of these wide tires—or a narrow one either, comes over one of them you know that it jolts down and makes a hole in the road. My friend did not suggest that the tires should be a greater width. That is all right, because you cannot run wide tires on these mud roads. I have on my farm 4 in. tire waggons, but I cannot get my men to take them off eight or ten miles on the road with a load; they say it kills their horses. They will take the narrow-tired waggon in preference every time. If you had a perfectly smooth road and you could keep it in repair, then the wide tires are all right, according to the French system, with the hind wheels running wider than those in front. Such tires greatly assist in keeping the road smooth.

I want to say one word about the cost of the system suggested. Let me point out to you that when you do away with the statute labor and commence to work your roads on any other system you are going to add very materially to the cost of it. My friend suggests that the Government have charge of some of these roads. My experience is that it generally costs considerably more to have it done in that way. You have got to employ some person to see that the contract is done properly. He suggests that we use some of the "rusty millions" in this Province. I want to point out that we have no "rusty" millions in this Province, it is all in good use. It is all laid away just the same way that one of you who has made a fortune puts his money away. We have got lots of uses for our money, and must use it to the best advantage. My friend suggests that the Government should give information. That is something I am preparing to do. I have in my office a paper that we are going to put out in the form of a departmental bulletin, giving all the information we can get on this matter. We are going to publish it by the thousands, and send it all over the country. That is the first step, so far as I know, the Government of Ontario has taken. I think it is due the farmers and others that they should know all there is to know on this subject. You will find, however, that it will be quite a while before much will be accomplished, but this education work must be persistently followed. We have got to add line upon line and precept upon precept, and by and-by we will see the day that all over the country we will have better roads, and the people will be able to enjoy them, and thus add greatly to their happiness.

CHEMISTRY OF FARM-YARD MANURE.

Frank T. Shutt, M.A., Chief Chemist, of the Dominion Experimental Farms, Ottawa, then delivered the following address: There are few subjects, I suppose, of greater importance to the farmer than the one I am to address you upon to-day, and I think you will agree with me that its discussion, both from the standpoints of theory and practice, at such a meeting as this, composed of thinking and practical agriculturists, should be attended with profit to all. I say this word "discussion" advisedly, because from my experience I have found that the greatest good results not from a lecture alone (no matter how good it may be, nor how well the subject may be presented), but by a judicious and well directed discussion following a brief introduction setting forth the more salient points of the subject. I have laid some stress upon the importance of the subject; in a few words I should like to make good my claim.

In the first place I think that a consideration of the subject, "Farm-yard Manure," leads to a practical realization of the fact that plants feed—that like animals

they require food for growth and development. I find in speaking to many farmers, who have been in the profession of agriculture all their lives, that they have never thoroughly realized this fact, and I am the more sure of this because they have not worked up to it. A man cannot be said to properly believe and realize anything until he works up to it.

It is a very wide and embracing subject. It leads us to consider the nature or character of plant food, the condition or availability of the food requisite for plant nutrition, and also the amounts of the different fertilizing elements required by different crops. It also includes the subject of soil exhaustion, as well as of soil fertility, subjects regarding which we as yet know very little of a definite character. It plays a prominent part in the choice of crops, and is intimately related to success in general farming, dairying, stock-raising, and fruit-growing.

I take it that, other things being equal, we shall find that the wealth of the farmer is proportionate to his crop. His crop is proportionate to the fertility of the soil, and the fertility of the soil depends upon the economical using of his barn-yard manure—that is, obtaining the greatest return at the least cost. A right understanding and correct practice in this matter, therefore, is of paramount importance. We must agree, at the outset, upon what barn-yard manure is. Commonly, I think it is understood to include the mixed excrements of the horse and the cow, in addition to the bedding used.

The value of barn-yard manure depends primarily upon the percentage of nitrogen, phosphoric acid and potash which it contains, and therefore the chief value of any particular sample of barn-yard manure is in direct proportion to the amounts of these elements that it possesses. Secondly, its value is dependent upon the presence of other and secondary elements, such as lime and magnesia. Thirdly, it is valuable for its organic matter, which in decomposing in the soil sets free much carbonic acid. This renders soluble locked-up food of a mineral character, of which all soils contain a more or less liberal amount. Organic matter (apart from its nitrogen) is not direct plant food, but by virtue of its products of decomposition and their beneficial action in the soil, it has a high value, and one which we must not overlook, as I fear we have been too apt to do of late years. Moreover, organic matter is the natural food of the microscopic organisms that convert organic nitrogen into nitrates, which are the nitrogen compounds available for plant nourishment. The important part that these organisms play in rendering soils fertile has of late years been a matter of careful research by the most eminent agricultural chemists in the world. The intelligent and studious farmer is appropriating the knowledge thus gained and applying it for his own profit. We never find a virgin soil that is fertile but what it is rich in organic matter. Recent scientific research tells us why this is, and also how to imitate or bring about those conditions most suitable to luxuriant plant growth.

These, then, are the three chief qualities that make farm-yard manure valuable, and they are all deduced from a chemical study of the subject. There are other values, but of them I cannot speak to day. For instance, there are the mechanical uses of barn-yard manure—how it brings about an amelioration or improved condition of tilth, how it allows air to freely permeate a soil, how it in a great measure prevents evaporation of soil moisture, how it renders a soil absorbent, and assists in maintaining a proper degree of temperature.

I intend to-day to consider only the *composition* of farm-yard manure, and the causes which affect its value as a direct supplier of plant food. The composition of farm-yard manure in the fresh state is dependant upon—

1. The proportion of horse to cow manure.
2. The proportion of the litter to the excrements.
3. The quantity and the quality of the food fed, and more particularly the latter.
4. The age and function of the animal producing the manure.
5. The care with which the liquid portion of the manure is maintained.

As all these factors affect the composition of manure, we can readily understand the great differences in value that exist between different samples of barn-yard manure.

Before discussing in detail these factors or conditions, I would ask your careful consideration of the following table, as throughout my lecture I shall constantly refer to it:

AVERAGE COMPOSITION OF MIXED EXCREMENTS.

Animal.	Nitrogen.		Phosphoric Acid.		Potash.	
	Per cent.	Per ton.	Per cent.	Per ton.	Per cent.	Per ton.
		lb.		lb.		lb.
Horse	.6	12.0	.3	6.0	.5	10.0
Cow	.4	8.0	.1	2.0	.8	16.0
Sheep	.9	18.0	.5	10.0	1.0	20.0
Pig	.5	10.0	.1	2.0	.5	10.0

1st. *The proportion of horse to cow manure.* In the foregoing table we have stated the amounts of the chief fertilizing constituents of the ordinary manures in their order of value—nitrogen as the most costly, and potash the cheapest. It will be observed that both in nitrogen and phosphoric acid horse manure is richer than that from cows. Therefore, the more horse manure the more valuable the mixed or farm-yard manure. Taking the above figures as representing fair averages, and assigning the following values: nitrogen, 17 c. per lb.; phosphoric acid, 7 c. per lb.; and potash, 5½ c. per lb., one ton of horse manure (the mixed excrements) would be worth $3.01, and the same quantity of cow manure, $2.38. For the purpose of reference I have added the composition of sheep and pig manure. Sheep manure is an exceedingly valuable one, being rich in all fertilizing elements. Its worth on the above basis would be $4.86 per ton. Although the figures representing the composition of pig manure are the results of averaging many analyses, there is a wide divergence between different samples, principally caused by the nature of the feed. I would now draw your attention to the fact that cow manure is very rich in potash, and in this way its addition supplements in plant food that from the horse. Together they form a complete manure, and one in which the fermentation is more easy to control than when the manure consists of either one by itself.

2nd. *The proportion of litter to the excrements.* Litter is used for two purposes: first, as a bedding material to keep the animal warm, and secondly as an absorbent to retain the liquid manure. In so far as litters possess nitrogen, phosphoric acid and potash they enrich the manure; according to their efficiency as absorbents they serve to preserve the valuable and liquid portion of the excrements. I have prepared the subjoined table of the more common bedding substances, keeping this double object in view.

BEDDING MATERIA — AVERAGES PER TON.

Material.	Nitrogen.	Phos. Acid.	Potash.	Absorbed.
	lb.	lb.	lb.	per cent.
Wheat Straw	9.6	4 4	14.	230
Oat "	11.2	5.6	.5	210
Pea "	20.8	7.0	.9.8	280
Leaves (autumn)	20 0	5.0	4.0	160
Sawdust	20.0	1.0	2.0	420
Muck (air-dried)	28.0	5.6	6.4	400

Wheat straw is the most common of all litters. Its absorbent qualities are high, 100 lb. being capable of absorbing 230 lb. of water (see last column of above table), but as it does not rot readily its fertilizing constituents are not of immediate value in the soil.

Oat straw is more valuable by reason of increased quantities of nitrogen and potash, but on account of its feeding value it is seldom used as litter.

Pea straw would yield a manure richer in nitrogen than either of the former, as it contains a large amount of this element.

The tubular structure of the straws enhance their absorptive qaulities, and to this end their value is increased by cutting the bedding.

I can only speak but doubtfully as to the advantage or value of dried leaves for bedding. They have not high absorptive powers. The general impression is that when other material is obtainable it will not pay to collect them. The analyses show, however, that as they fall they possess a considerable amount of plant food.

Sawdust is a fairly rich material and a good absorbent. Without previous fermentationin the manure pile, however, it will remain undecomposed in the soil for many years, and its constituents are consequently unavailable.

With regard to muck, I can speak very highly. It is not only an excellent litter, but also a valuable manure when properly treated. For some years past we have analysed samples of muck from various parts of the Dominion, and the result has been that in certain districts the use of this muck has been extensively practised. We find in muck a material rich in nitrogen. In the matter of nitrogen the percentage in muck might have been placed much higher than recorded above The analysis of some forty or fifty samples last year gave an average of 33 pounds per ton, and some samples yielded as much as 40 pounds per ton. The nitrogen becomes easily available when rightly composted. Muck in an eminent degree serves to hold fertilizing material in the liquid portion of the manure, which might otherwise be lost; and the fermentation of that liquid manure in the muck brings about the solution of the elements of fertility in the muck itself. This is a material which can often be obtained at the cost of simply drawing it. The latter should be done in the winter, and the muck allowed to dry. After having become thoroughly air-dried it can be used for the purpose of bedding or composting. Good results will be obtained by spreading a thick layer of the dry muck in the barnyard. This will prevent the liquid portions from leaking away. It is also an excellent absorbent in the pig-pen, and any other place where waste of manure is likely to occur.

3rd. *The quantity and the quality of the food fed.* Only in small quantities are the nitrogen, the phosphoric acid, and the potash in the food of the animal retained in the system. You will understand, then, that the elements of plant food in a fodder are to a very large extent excreted. Consequently, the more nitrogen, phosphoric acid and potash the food contains the more the manure will contain. Since the percentages retained do not vary within very wide limits, the fact is patent that the richer the food the richer the manure. From this you will readily infer that a food which is low in albuminoids gives a manure that is poor in nitrogen, and thus it is that cows wintered on straw alone cannot produce a rich manure.

The *quantity* of the food affects the quantity of the manure rather than its quality. Indeed, some hold that the effect of quantity in no way alters or modifies the value of the resultant manure—that the only result from an ample supply of food is that a larger quantity of manure is produced. I myself am not of this opinion. I think that when the quantity fed is in insufficient amounts, there will be a tendency for the animal to absorb and retain a larger percentage of nitrogen from the food than when it is supplied liberally. But this point I do not press. It is one on which there is considerable divergence of opinion.

Let us remember in this connection then, that, save for the small quantity required by the animal, the fertilizing elements are excreted, and that consequently poor feed means poor manure—the richer the food the more valuable the manure.

4th. *The age and the function of the animal.* I have just said that the amounts of the fertilizing elements retained in the animal system are very small, but these amounts are dependent upon the age and function of the animal. If the animal is young and growing, the muscle, blood and bone must be made in large quantities from the food; and consequently these demands upon the food leave the less to go into the manure. We can very well see from this that in the case of a young, growing animal the food is

exhausted to a very great extent of its fertilizing constituents. In the case of wool-bearing animals and in that of cows giving milk, we have a like condition of affairs; that is to say, they take the nitrogen for their wool and milk from the food consumed, and the more they retain the less there is eliminated. Therefore, the animal which will produce the most valuable manure, other things being equal, is the adult animal which is not producing flesh, nor wool, nor milk, since in merely maintaining life the fertilizing elements, nitrogen, phosphoric acid and potash may be said to be almost entirely excreted.

5th. *The care with which the liquid portion of the manure is maintained.* This is not the least important factor because it is placed last; indeed it is one of the most important of those which regulate the value of the manure. The comparative value of the liquid to the solid portion of the manure must be recognized by the farmers if economy in manure production is to be observed. In the first place, as we have already seen, liquid manure is much more valuable than the solid. It seems very necessary to emphasize this point, because the common neglect throughout this country gives evidence that there is a failure to practise up to the belief. For the purpose of impressing you the more forcibly with the great importance of the point I am now making, I would direct your attention to the following chart. It states the pounds per ton of nitrogen, phosphoric acid and potash in the solid and liquid portions of the manure of the horse and cow, and at the same time shows you the relative value of each.

SOLID AND LIQUID EXCREMENTS.

Manure.	Nitrogen.	Phos. acid.	Potash.	Value.
	lb. per ton.	lb. per ton.	lb. per ton.	$ c.
Horse { Liquid	30.4	.....	18.5	6 20
Horse { Solid	11.2	7.0	2.0	2 50
Cow { Liquid	21.0	.....	27.2	5 07
Cow { Solid	8.7	2.4	.8	1 69
Samples of drainage water from manure piles;				
A	1.02	.208	5.32	48
B	2.28	.076	3.96	60
C	3.20	.200	9.80	1 10

The foregoing chart, however, does not show you all the true worth of liquid manure contrasted with the solid portion. Plant food, unless it is soluble, is not available to a growing crop. The plant food in the liquid portion of the manure is very much more readily available for plant nutrition than it is in the solid portion; consequently we must assign it a greater value than here represented, where the same values have been used alike throughout for the calculation. How necessary is it then that we should preserve with care all the liquid manure produced on the farm.

On this account I thought it well to have the analysis of certain drainages from manure piles placed on this chart, so that I could draw your attention to their composition, and hence to their value. A. B. C. are three different samples.

The chief conditions which regulate the composition of the drainage from a manure pile are the extent of exposure, the amount of rainfall and the degree to which fermentation has progressed. As the conditions are variable, so is the composition. Consequently, here, even in three samples, we see that the value fluctuates between 48 cents and $1.10. We might have drainage waters from manure piles worth less and some worth more than these quoted. The amount of fertilizing elements that are constantly going to waste on the farm is thus brought before you in an emphatic way, and I trust I have shown you the necessity for preserving it in some way. Liquid manures not only contain their elements of plant food in a highly soluble condition, but they form a very favorable medium for the growth and development of those microscopic plants, bacteria, which are the agents, with the assistance of the oxygen of the air, in converting the nitrogen of inert organic matter into nitrates, the form in which plants can utilize it.

We have, then, three reasons why the liquid portion of the manure is the most valuable: Firstly, the large number of pounds of plant food per ton; secondly, the very soluble condition in which this exists; thirdly, because it forms a favorable means for the growth of the nitrifying agents. Lastly, this drainage being of an alkaline nature, acts as a solvent upon other material in the manure, especially nitrogenous substances, bringing them into a soluble condition.

Experiments with Manure at C. E. F., 1892.

I wish to speak now with regard to some experiments that I have carried on at Ottawa this past year. A great deal has yet to be done in investigating manure in Canada. We hear all sorts of opinions from various men, and we have as yet very little scientific data on the subject. We want more careful observation as to the results obtained by different methods of preservation of manure, and to make a beginning in this good work at the Experimental Farm I made the following experiments this year. They were conducted with the view of ascertaining what loss, if any, resulted from spreading well rotted manure upon the field—say 3 or 4 days or longer before plowing it in. For economy of labor it is often found advantageous to do this. Two samples of manure were taken—the one well rotted and past active fermentation, so that it had again come to the temperature of the atmosphere—the other in a high state of fermentation, very hot, but only partially rotted. These manures were then carefully analysed, and the results are to be found in the annexed table under the heading "before exposure."

	Nitrogen.		Phos. acid.		Potash.		Total Value.
	Per ton.	Value.	Per ton.	Value.	Per ton.	Value.	
	lb.	$ c.	lb.	$ c.	lb.	$ c.	$ c.
Well rotted, before exposure.....	10.3	1 75	8.5	0 60	15.9	0 87	3 22
" " after "	10.1	1 72	8.5	0 60	15.9	0 87	3 19
Partially rotted, before exposure..	9.8	1 67	6.0	0 42	13.6	0 75	2 84
" " after " ..	9.3	1 58	6.0	0 42	13.6	0 75	2 75

Samples of each of these manures were then spread in thin layers on glass plates and exposed to the rays of the sun daily for a month. At the expiration of this time the manures were again analysed. The results are tabulated as "after exposure." Any real loss that would occur on the field after spreading would similarly take place on the glass plates, since fertilizing material washed out by the rain would be retained by the soil. We have then, to see if there has been any loss of nitrogen by volatilization of the ammonia. The chart shows us that very little is lost under such circumstances—that in the case of the well rotted and cold manure there is only a difference of 3 cents per ton in value between the unexposed and exposed, while the manure spread while hot lost 9 cents in value per ton. The losses, then, are very small, even under the most favorable circumstances for the volatilization of ammonia. The manure upon exposure in thin layers dries up quickly and further fermentation stops.

In speaking of the loss of ammonia from manure, I would say a word or two regarding the escape of this valuable constituent in stable and manure heaps. If the litter is in insufficient quantities and no absorbent used, a strong smell of ammonia is to be observed in the stable. This ammonia, or rather carbonate of ammonia, is developed by the fermentation of the urine or liquid portion of the manure, and being readily volatile, easily escapes into the atmosphere. Plenty of bedding (if straw, preferably cut into one or two inch lengths) and the use of an absorbent, such as gypsum or dry muck, are therefore advised. Gypsum serves to fix the ammonia by converting it into a form which is not volatile.

Where cow manure predominates in the manure pile, I do not think there is much loss from this cause, but in the case of horse manure it may be very different. In such it often occurs that, owing to the light and easily fermentable character, there is a considerable loss of ammonia. Hence the great economy in thoroughly mixing the two in the pile

Cow manure is slow to decompose, but its fermentation is aided by that from the horse; horse manure would often fire-fang and lose in value were it not for the presence of the colder and more moist cow dung.

Principles of Economic Fermentation.

The object in rotting manure is to render its fertilizing elements available for plant food. Green or fresh manure is almost valueless to plants—fermentation, either in the heap or in the soil, must first take place before its elements can be used as nourishment by vegetation.

Fermentation or rotting is brought about by the aid of microscopic plants, known as bacteria. They feed on the organic matter of the manure, converting it into other forms, liquid and gaseous. They require, as well, air, moisture and warmth for their development. Mention should be made, however, that there are some bacteria of fermentation which do not require air. These live and grow in the bottom of the heap, and produce different compounds to those that live near the top of the pile. They develop no heat. Where the manure has access to the air and other conditions are favorable, the bacteria or microscopic plants burn up, by the assistance of the oxygen of the air, much of the organic matter to carbonic acid, and a considerable amount of heat is generated in the process. Again, it is one of these organisms that converts the nitrogen, present as urea (in urine), into a salt of ammonium, making it fit for plant use. The ammonia so formed, if fermentation is not checked or an absorbent used, may be to a large extent lost. The alkaline solution of ammonia serves a useful purpose in dissolving nitrogenous material in both litter and dung, and thus prepares them for plant food.

We must therefore induce fermentation, but, at the same time, we must keep it under control. We have seen that liquid manure is much more valuable than solid, and also that fermentation cannot proceed without moisture. It will be good economy, then, to keep the liquid and solid portions of the manure together, thereby saving fertilizing material and the cost of labor incident upon preserving them separately. The pile should be trodden down and kept moist, though not soaked. The degree of fermentation to which manure should be allowed to proceed before application must depend upon the character of the soil and the nature of the crop. The best rotted manure should go, in my opinion, upon the lightest land, applying it frequently so that as far as is practicable the fertility of the manure may be largely used at once by the growing crop. With soils of this character, that leach easily, it is better to manure for the crop than to try to permanently fertilize the soil. To increase the amount of humus in such soils and improve their tilth, muck will be found cheaper to use than manure; or a better plan still would be to plow under a crop of peas or clover.

Plants, such as the cereals, that have a short growing period, should be supplied with well-rotted manure. They can only take their food for a few weeks, and consequently they should have it in a readily available form—such as is found in well-rotted dung.

The manure that is least fermented on the farm should be put on the heaviest land and used to furnish food for the long-lived crops—more especially roots. A clay soil is retentive of the fertilizing constituents, and does not lose its plant food to the extent that sandy soils do when exposed to rain. Nitrification goes on during the summer months, and thus continually supplies from the manure soluble food. Again, a manure that is not thoroughly fermented will improve the tilth of a heavy soil, opening it to the action of the atmosphere—whereas well-rotted manure has not this beneficial action to the same extent.

Taking everything into consideration I think the most serviceable manure is one partially rotted, one in which fermentation has begun before it is applied to the field. It is more concentrated than fresh manure, and is rich in nitrifying organisms. Further, it is more easy to spread. Manure must ferment before it can be used by plants, therefore, in the majority of cases, it is good economy to start this fermentation so that the plants are supplied with soluble food in the early stages of growth. When fresh

manure is used some time must elapse before the fermentation sets in and there is any appreciable amount of plant food, no matter how favorable the conditions are. Thus it results that in the early summer months there is a scarcity of food. This is just the time when the cereals make the most rapid growth and require an abundant store to draw from. With other crops, as I have pointed out, it is different. When the growing season extends into September there must be, if the weather has been at all favorable, much material of the manure converted into assimilable forms by the agency of bacteria that can be used by the longer growing plants.

I must now draw my address to a conclusion. I have but touched upon the salient points of my subject—details I have not been able to enter into. I have endeavored to impress upon you the relative values of different manures, and the value of the liquid portions compared with the solid. I have stated the essentials for fermentation and given it as my opinion that the liquid and solid parts should be preserved together. Also that the manure pile should be kept *moist*—preferably with its own drainage liquid—and tolerably *compact*. Under such circumstances but little loss can ensue. I have further shown that fermentation is requisite (either in the pile or in the ground) before the plant food of manure is available. If you wish to apply the manure fresh, put in on the heavier soils, but on light soils and for the shorter-lived crops the partially rotted manure will give more immediate results. In the rotted condition it is more concentrated than when fresh, and less labor is required to handle it. It contains and gives to the soil the organisms of nitrification, without which the nitrogen of humus would be of no value to plants. And, lastly, rotted manure can be more evenly applied to the soil than before it has undergone fermentation.

Prof. SHUTTLEWORTH: I wish to say that the address which we have just listened to on the composition of farm-yard manure is, in my opinion, a most excellent one, and I like it the more because it is the result of original work. I think there is no data on this subject which is late and reliable; and this fact has so impressed me this winter that I have decided to pursue the examination of farm-yard manure as we have seen to-day it has been done. It is very hard to get the practical farmer to take an interest in this subject, but the time is coming, I believe, when the farmers tilling the soil will be as well acquainted with the composition of manures as those who at the present time are teaching agricultural chemistry, and until that time comes the farm-yard manure will not be well made and well preserved. The mixing of the liquid manure with the solid is an important factor in the making of manure. I think it would be well to cut the litter before using it, because it is an important thing to have the liquid manure absorbed by the litter, and in this way there would be more complete absorption. When liquid manure is left too exposed to the air there is great loss of nitrogen.

The opinion that I have been led to form in regard to the degree of fermentation which manure should undergo is this, that on heavy soil we should apply unrotted manure, but in other cases it is best to have it rotted. There is great trouble on the farm in getting the manure rotted. We know that where manure is tramped by the animals it does not undergo much fermentation; so I would feel strongly of the opinion to have the litter cut, and have the barn-yard of such a form that there is no loss by draining, and during the winter season draw the main manure into the field and pile it in squares where it will undergo that partial fermentation.

Prof. JAMES: I am hardly in a position to discuss the paper as I have heard but a portion of it. But I am afraid that one part was not touched upon at all, and perhaps this part presents as much difficulty in connection with agriculture as anything that has been touched upon. Perhaps it might be called the æsthetic part of it. I think we would do a great deal to bind the farmer's son to the farm if something could be suggested in the handling of this material that would make the work a little more agreeable.

President MILLS: I do not like to allow the opportunity to pass without saying that I have been personally pleased with this address by Prof. Shutt. It is comprehensive and very clear, and while it is scientific, I think Prof. Shutt succeeded in drawing a practical lesson which even the commonest farmers can understand. I do not know the way in which the quantity of food effects the value of manure, unless it be when an

animal is overfed and has more than it can digest that the nutritious elements, that is the nitrogen, phosphoric acid and potash will pass out unappropriated; or is it that when an animal has not a sufficient amount of food that this loss occurs? In regard to the exposure of manure, I do not know myself as to how great the loss is from exposure of, liquid manure. I presume, however, it is great.

Prof. SHUTT: I may say that President Mills has just stated the two reasons or causes that I should have gone into with regard to the quantity of food affecting the quality of the manure, but I felt that time would not permit. I know that I stand somewhat alone in my opinion upon this matter. In the case of scarcity of food with a certain ration, the percentage of nitrogen, phosphoric acid and potash retained by the animal are, I believe, greater than when the animal is liberally fed. Nevertheless it is true that to a great extent the percentages taken by the animal from the food are regulated chiefly by the function of the animal. On the other hand, we find that when there is an excess of food, not only does that excess pass through the animal but the elements produced by the action of the digestive fluids are not assimilated in due proportion, and thus some digested food is not taken into the blood but passes out in the excrement, consequently the quality of the manure in that way is affected by the quantity of the food. In regard to the other question of the loss, by exposure in the manure heap, of ammonia or nitrogen, the experiment referred to does not give you any explanation. We all understand, however, that there is a great loss when the manure is very loose and not sufficiently moist. I think, with Prof. Shaw, it is very useful to cut the litter. The factors which regulate the value per ton are: the extent of fermentation, the exposure, and the amount of rainfall, other things being equal.

Mr. HUTT: I spread the manure on the fields in winter; does any loss occur from this?

Mr. MACKENZIE: In connection with that question, allow me to add a little more. Do the scientists here know of data sufficient to give the amount of loss when manure is spread in the winter?

Prof. SHUTT: It is probable that the loss is very small, if anything, when the fields are not flooded in the spring, because directly the manure is carried out it is frozen and no fermentation takes place. When that manure is thawed it is plowed into the ground and there fermentation goes on and the elements of fertility retained. I do not think therefore that there is any loss except in the case where the fields are flooded in the spring. Of course, then the amount of loss is exactly proportionate to the amount of water, containing drainage from the manure, that is carried off the surface of the field.

REPORT OF APICULTURE COMMITTEE.

The following report was read by Mr. R. F. HOLTERMANN, of Brantford: It will only be necessary for me to say a very few words, as Mr, Mackenzie has really got the report of the work which has been done. I would simply say that there is no question at present which is engaging the attention of the bee-keepers more than the foul brood disease. As you know we have an inspector, Mr. McEvoy, who is present with us, and he is doing that work at the same time. We should have liked to have made some tests in regard to the disease which we were not able to complete this year, but we hope to carry them on during the next year. I may say also that the Apiculture Committee feels very much indebted to Mr. Mackenzie for the work he has undertaken. The Committee has supplied him with all the material, and this was the only expense of the year. I am sure there is no one present who does not value scientific work.

THE FOUL BROOD BACILLUS (*B. Alvei*); ITS VITALITY AND DEVELOPMENT.

Mr. J. J. Mackenzie, B A., Bacteriologist of the Provincial Board of Health of Ontario, read the following paper: Gentlemen,—At the request of your secretary, Mr. Holtermann, I undertook for your Union some investigations on the subject of foul brood, the results of which I purpose giving you in this paper. Although it is almost a year now, since I undertook this work under the auspices of the Agricultural and Experimental Union it is by no means exhausted, and there are many points which require to be further elucidated, which I have not had time as yet to touch on, owing to the fact, that investigations on foul brood had to be carried on simultaneously with my regular laboratory work. These points I hope to work at next summer, and reserve the privilege of reporting again to your Union on the results of further investigation.

The subject of foul brood is an old one to apiarists and an intensely interesting one to Canadian bee-keepers, but in reading over the bee journals one cannot help being struck with the great want of unanimity amongst bee men as to the disease, how it should be treated, how it is spread and on many other points. Some would have us believe that the disease arises *de novo* whenever unsanitary conditions prevail; others claim that there is a specific infection and where the disease arises it must have originated from previously existing disease; some claim that the honey is the only method of transmittal, others that it is not; and so on, on every point there seems to be plenty of arguments *pro* and *con.*

I have attempted in my work to take hold of some of these controverted points from a bacteriological standpoint in order to aid in coming to some definite conclusion. Some of these points I should consider settled from the results of previous investigation, but as many bee men do not seem prepared to accept this, my work will have value as confirming what has already been done.

Before an association which includes many practical bee-keepers it would be superfluous to enter upon a minute account of the clinical features of the disease Most of you know them better than I do. I certainly would not be prepared to "spot" foul brood in an apiary, although I certainly think I can under the microscope. The infectious character of the disease has been generally accepted for many years, but not until Cheshire and Watson Cheyne worked it out scientifically was it definitely proved. They isolated a bacillus (*bacillus alvei*), which they found in the diseased brood, and which they cultivated on nutrient media for many generations finally reinfecting perfectly healthy brood from these pure cultures. This evidence to a bacteriologist is absolutely conclusive that *bacillus alvei* is the specific cause of foul brood. Consequently when I began my investigations on some samples of diseased brood which were sent me through Mr. Holtermann, I looked at once for *bacillus alvei*; microscopically and by means of bacteriological methods I had no difficulty in isolating a bacillus which corresponds in all points to *bacillus alvei.* It is a bacillus, similar to that of Cheshire's in size, produces spores which are somewhat thicker, giving the bacillus a clubbed appearance. On agar jelly it grows rapidly so as to cover the whole surface. In gelatine its growth is very peculiar, shooting out from the infected point in all directions. On potatoes it produces a yellow growth. All these characters show conclusively that it is identical with *bacillus alvei.* There seems no doubt, therefore, that the foul brood which we have in Ontario is the same disease and produced by the same bacillus as in other places.

Many prominent bee-keepers both here and in the States, however, maintain that wherever unsanitary conditions are allowed to prevail, wherever chilled brood is allowed to putrify or decapitated drones are left to decay in the hive, foul brood may arise *de novo.* This is not a new theory either in bee-keeping, or in medicine, but unfortunately it is a theory which is not supported by the results of investigation. Diphtheria naturally will develop more readily if unsanitary conditions are present, but it certainly will not develop if the *bacillus diphtheriæ* is absent. The same is true of other diseases and consequently when we come to consider such a decidedly infectious disease as foul brood and learn the facts about it which such men as Cheshire have told us

we naturally come to the same conclusion. If I were to maintain that a Carniolan queen might lay an egg which would develop into a humble bee, bee men would be inclined to think that not only my bee knowledge but also my scientific knowledge was at fault; but yet in all the bee journals I find many prominent bee-keepers maintaining that an ordinary microbe which produces putrefaction may become metamorphosed into the specific cause of foul brood. It is easy enough, however, to combat such an opinion upon *a priori* grounds; but not quite so easy to offer convincing proof.

In order to do this I thought it worth while to try some experiments. With this end in view I obtained some comb containing chilled brood and endeavored to isolate *bacillus alvei* from it, but without success.

There were plenty of other bacteria, but none which presented the well-marked morphological characters peculiar to *bacillus alvei*. Again I had sent to the laboratory a piece of perfectly healthy comb. I killed the brood by chilling; then I infected some of the cells from a pure culture of *bacillus alvei*. I allowed all the killed brood to putrify in a moist chamber for two weeks, at the end of which time I obtained *bacillus alvei* again from the cells which had been artifically infected but could find no traces of it in the other cells. I left this comb in a moist chamber for several months and again examined but with the same results; in the cells in which *bacillus alvei* had been placed it was still to be found, in the others it was not present.

It seems to me that an experiment such as the above conclusively shows that there is a distinct difference between foul brood and ordinary putrefaction.

In considering the subject of the vitality of *bacillus alvei* the first question which naturally arises is its power to resist heat. We know that bacilli which produce spores, and those which do not stand in entirely different positions in this regard. The sporeless bacillus is destroyed at a much lower temperature than one which contains spores. Consequently in considering the question of the vitality of *bacillus alvei* which produces spores very quickly and easily, we may confine our attention entirely to the vitality of the spore.

This is of special interest, as the question has been repeatedly raised whether it is dangerous to use comb foundation made from foul broody wax. Does the temperature to which the wax is raised in the manufacture of comb foundation sufficiently destroy the vitality of the spore? Can the spore germinate and infect the brood when once enclosed in the wax?

These questions have been raised by many careful thinkers among bee men and certainly deserve attention. The second point ought to be considered first since if surrounding a spore with a film of wax prevents its germination we need pay no further attention to the question of heat. The crucial test of this would naturally be, supply a healthy colony with comb foundation known to contain the spores and observe the result. This I had hoped to try with the assistance of your secretary, but other work came up which interfered with the carrying out of this experiment and consequently it had to be postponed until next year. However, I was able to perform one experiment which throws some light on the subject. Mr. Holtermann, the secretary of your Union, sent me several pounds of very fine wax, such as is used for the manufacture of comb foundation. I cultivated the *bacillus alvei* upon agar jelly until I had a large quantity of the bacilli containing spores; this was carefully scraped off the jelly and dried first in the air and then over sulphuric acid. The resulting greyish mass was pulverized with a sterilized pestle and mortar, and finally mixed thoroughly with the melted wax kept at a temperature sufficiently low to prevent the immediate destruction of the spores by heat. By this means an enormous number of spores were introduced into the wax. After stirring the wax for some time in order to insure a proper mixing it was allowed to cool. This as you all know takes some time, when dealing with a considerable quantity. During the cooling I was careful not to disturb the wax.

After it had solidified I set out to discover if I could again obtain my bacillus from the infected wax. If it could germinate in the nutrient media it certainly would in the bees, and that point was to a certain extent settled. Now I obtained the following results:

From the upper layers of the infected wax I was unable to obtain cultures of the bacillus alvei, either by melting the wax in the nutrient jellies or by allowing particles of the unmelted wax to fall on the surface of these jellies.

From the under layers, however, the results were different; particles of wax placed on nutrient agar in an oven kept at 98°F. became surrounded in 24 hours with a luxuriant growth of bacillus alvei. When the wax was melted into the agar or into beef tea I also obtained the bacillus, consequently it looks as if the mere fact of enveloping the spores with a film of wax was not sufficient to prevent germination. I confess I cannot understand how a spore could germinate when surrounded with a film of wax. Spores in germinating require moisture, and if a spore is completely imbedded in wax it cannot obtain sufficient moisture, to germinate; I would rather believe, therefore, that in this particular experiment the spores had not each an envelope of wax, but that many of them were partially free from the wax. Now if this was the case in my experiment where I endeavored to make the incorporation of the spores in the wax as thorough as possible, I certainly think it may frequently be the case when foul broody wax is used and no particular precautions taken. That even when spores are thoroughly surrounded by wax they may not be freed occasionally by the workers is a point which requires further elucidation and upon which I intend to try some experiments next year.

In looking through the bee journals, however, I find it everywhere maintained by foundation makers that they never knew of a case of foul brood originating from foul broody wax; and I have yet to discover a well authenticated case where this has occurred. What explanation can we offer of this widespread opinion?

I explained to you above that I was unable to cultivate bacillus alvei from the upper layer of the infected wax. Your secretary also sent me a small specimen of wax which he stated he knew to be from foul broody comb. This I examined repeatedly for foul brood but was able to obtain it only once. I think we must look to the physical conditions for an explanation of the freedom from infection through comb foundation. The difference in the specific gravity of the bacteria and of melted wax is so great that throughout the process of manufacture the bacteria tend to fall to the bottom. The first refining of the wax must of course remove the greater quantity and the vast majority of the remainder will settle to the bottom during the process of foundation manufacture. But that the simple process of mixing the infected material with the melted wax is not sufficient to prevent germination I think is shown by the results quoted above where simple fragments of infected wax when placed on agar jelly gave rise to a culture of bacillus alvei.

This question I hope to touch on again after I have had an opportunity of supplying healthy bees with foundation made from infected wax.

The other question is whether the temperature to which wax is raised during foundation making is sufficiently high to destroy the spores of foul brood. In order to decide this question there are several points to be noted. The first is the character of the heat. We know that moist heat will destroy bacteria and their spores much more quickly than dry heat, and Mr. Corneil of Lindsay has raised this point several times, claiming that the heat to which the bacteria are exposed in melted wax is not moist heat but dry heat, consequently we must heat to a high temperature and for a long time in order to destroy the spores. The point is undoubtedly well taken, and can only be settled by direct experiment. In order to determine the temperature at which the spores are destroyed in melted wax, I used a method that was first described by Koch. Sterilized silk threads were saturated with a beef tea culture of bacillus alvei in which there were large numbers of spores. These threads were then allowed to dry and in the dry state were preserved. These dried threads were introduced into the melted wax and allowed to remain in it for a definite time at a fixed temperature. At the end of that time the thread was introduced into the melted agar or into beef tea heated to the melting point of wax, and thoroughly shaken so as to separate the wax as much as possible from the threads; then the culture medium was rapidly cooled and the tubes placed in the ordinary cultivating oven kept at 98°F. If I obtained a growth of bacilli I concluded that the threads had

not been sufficiently heated in the wax, if I did not, I concluded that they had been sufficiently heated. The following are my results :

At 212° F. (100° C.)	For one-quarter of an hour : growth.
	For one-half an hour : growth.
	For one hour : growth.
	For one hour and a half : growth.
	For two hour : growth.
	For two hours and a half : no growth.
At 194° F. (90° C.)	For one-half hour : growth.
	For one hour : growth.
	For two hour : growth.
	For three hours : no growth.
	For four hours : no growth.

On the other hand a temperature of 122° F. (50° C.) did not destroy the spores in twenty-four hours.

I have repeated these experiments several times with the same results so that I would conclude that to destroy the foul brood in wax it is necessary to heat to a temperature of at least 194° F. for at least three hours. Now the question arises, does this take place during the process of manufacture of comb foundation? In order to get as much data as possible on the subject I wrote to Mr. Larrabee, of Michigan Agricultural College, as he had kindly offered me any assistance in his power. He applied to two prominent foundation makers for information. From their replies it is apparent that for a short time at any rate during the refining and purifying of the wax it reaches a temperature quite at or near 212° F. During sheeting, however, it apparently does not reach a temperature much above the melting point, say 175° F. They both seemed to agree that steam heat for too long a time injures the quality of the wax.

In the *American Bee Journal*, 1891, p. 470, we find some statements on the subject in a reply by two prominent foundation makers, to an article by Mr. Corneil upon the dangers of infected comb foundation. One of them, Mr. Dadant, states that in refining it is heated for some time at 212° F., and is kept liquid for twenty-four hours. The other, Mr. M. H. Hunt, states that it is kept at the boiling point for six or seven hours. If these are the actual temperatures reached during foundation making I am inclined to think there is little danger from foul brood in that direction.

I thought it possible that the whole question could be settled by introducing a certain amount of some disinfectant, say beta naphthol, into the melted wax, but my results have not been satisfactory. Apparently even the introduction of one per cent. beta naphthol into wax did not hasten materially the destruction of the spores. I was able to demonstrate the presence of living spores in wax containing one per cent. beta naphthol, and heated for two hours to 194° F.

From all these facts, and taking into consideration also the physical fact of the settling of the bacilli to the bottom, I should think that with reasonable care in the preparation of comb foundation the dangers of infection from this source would be slight. But that the spores may germinate after being mixed with the wax, I think I have shown.

Why the spores of the bacillus alvei are killed so quickly in the melted wax I am not able to explain, but it may be due to the fact that the wax itself when heated to such a temperature has an antiseptic value. That the spores resist other antiseptics as strongly as do the spores of anthrax, I have proved by testing.

Cheshire and others recommend a solution of two per cent. carbolic acid for disinfecting the hive after removing infected comb, but on actual experiment with the infected silk threads I found that two per cent. carbolic acid did not kill the spores in six days. These results are similar to those obtained by Koch for the spores of anthrax, and show that two per cent. carbolic acid cannot be relied on to destroy the spores. However, the question of the value of antiseptics I will take up more in detail later on in this paper.

I would like to say a word or two now on the methods of treating the disease. There are practically two methods ; first, the starvation method ; second, the method by medicated syrup. Mr. McEvoy's method of treatment, it seems to me, is practically a

modification of the starvation method. The first method is widely used both here and in the United States; whilst in England and Europe generally the second method is adhered to.

Considering the vitality of the spores of foul brood, it would seem at first sight useless to try any process which did not recognize as its foundation the destruction of the germ. I find, however, that many prominent bee-keepers who have had practical experience with the method of starvation, or Mr. McEvoy's method, accept it as successful. I have not had an opportunity to examine colonies which have been cured in this manner, and so cannot say that the bacilli have disappeared; I hope next summer to test this question more fully. We may, however, examine into the rationale of the method. In conversation with Mr. Corneil, of Lindsay, he made a suggestion which may be quite familiar to you all, but which seems to me the only explanation. That suggestion was that either starvation or comb building carried the infected nurses past the period at which they act as nurses, and give them a chance to rid their intestines of the germ. If this is combined with a removal to absolutely clean hives, with new foundation, it may succeed, but I must say that absolute cleanliness in this respect must be insisted on. As I said above, I have not had any opportunity of investigating the results of these methods practically, and so cannot speak with certainty.

The fact of the presence of the bacilli in the workers, and in the queen, bears, to a certain extent, upon this question. Cheshire and others make the statement that the bacilli are found in the intestine of the workers and in the ovary of the queens. My own experience confirms this. I have found them repeatedly in the workers, and in five queens from infected hives I succeeded in obtaining the bacillus from the ovaries of three. That they are not always present in the ovaries of the queens from diseased colonies is certain; their presence there is apparently accidental. For instance, in the case of one of last year's queens in a hive rather badly diseased, I was unable to find the bacillus, whilst in a six-weeks' queen from a hive in which there were only a few diseased cells, I succeeded in finding it.

Cheshire's statement that he found a bacillus in an egg of an infected queen seems to me to require confirmation. I have not been able to find the eggs infected myself, but it is a question which would require very long and careful investigation before one could be able to deny or confirm such a statement.

In the second method of treatment by medication I do not think that an absolute destruction of the spores takes place, any more than in the starvation method. As I have shown above, two per cent. carbolic acid was not sufficiently strong to destroy the spores, consequently it is not likely that 0.2 per cent, (one part in 500) would be strong enough. I tried 0.2 per cent., but found it quite unsuccessful. Its action then must have another explanation. To test this I made up a sterilized beef broth containing 1 per 500 of carbolic acid, and in it placed my infected silk threads. I found that there was no indication of growth. These threads were then taken out and placed in ordinary sterilized beef broth, and I obtained a luxuriant growth, *i.e.*, the 0.2 per cent. carbolic acid in the culture fluid, although it did not destroy the spores, prevented their germination. That, then, is the explanation of the value of carbolated syrup in the treatment of foul brood, it prevents the germination of the spores. The bee journals contain numerous examples of cases where carbolated syrup produced an improvement, but as soon as it was stopped there was a relapse. It is evident that here again, as in the starvation process, there must be combined an extremely thorough cleaning up, so that the best possible results may be obtained from the treatment. Medicated syrup does not destroy the spores, it simply prevents their development, and gives the bees a chance to rid themselves of the infection, and in that respect I certainly think resembles the starvation process. Its advantage over that is that it can be carried on for a longer time.

In the course of these experiments I tried another substance which has been much used since Lortet's work on the subject, viz, beta naphthol. I do not think, myself, from recent work on this substance, that beta naphthol should be ranked very high as an antiseptic, mainly on account of its insolubility in water. I found, however, that a bee broth containing 1 per 1,000 beta naphthol would not allow spores of *bacillus alvei* to germinate, and consequently had an equal value with 1 per 500 of carbolic acid. It has a

advantage over carbolic acid on account of the disagreeable taste of the latter, and I think would be more acceptable to the bees.

Salicylic acid in syrup has apparently the same effect, but I would not recommend the addition of borax, as Behring has shown that borax lowers considerably the antiseptic value of salicylic acid.

I tested also formic acid in the same way, but my results so far have not been satisfactory, owing to the uncertain strength of my sample of formic acid. I prefer to reserve a report upon it and other substances which I wish to try, until later.

Mercuric chloride I have not tested, as I do not think it wise to use it around the hive. The idea of using a one per 1,000 solution to spray the diseased combs, as suggested sometimes, is, I think, absurd, and would be a rather serious operation for any living brood.

You will see that I consider all these methods of treatment do not in themselves necessarily presuppose the destruction of the spores, but depend upon the fact that for a longer or shorter period the spores are prevented from germinating, and in this period they are eliminated from the infected bees. Whether the vitality of the bees themselves has an effect upon the elimination or destruction of the spores is a point which would be extremely interesting, but one on which at present we have no definite information. From the results of bacteriological work on other diseases we know that the animal body is engaged in a constant warfare with the disease germs which may be introduced, and this also may be the case in foul brood. Much more extended investigations, however, would be necessary to prove this. It is much safer for apiarists to accept the possibility of a recurrence of the disease after a course of treatment, owing to the lodgment somewhere of some of the spores of *bacillus alvei*, and by care and cleanliness remove this possibility. To do this, the hives and frames in which a foul broody colony has lived must be sterilized, and this may be done in various ways. For the sterilization of material by disinfectants there was a tendency formerly amongst bacteriologists to run to such disinfectants as corrosive sublimate, carbolic acid, etc., but later work has shown that there are a number of common chemicals which will act just as well, or perhaps better. Corrosive sublimate has lost much of its reputation as a disinfectant within the last few years, and carbolic has been shown to be not nearly so powerful as at first supposed.

For cleaning hives and frames which are suspected to contain the spores of foul brood, a hot 10 per cent. solution of soft soap is perhaps as effectual as any that can be recommended. A good strong solution of washing soda, when hot, is also very active, destroying the spores in a few minutes. Both these are certainly better than 5 per cent. carbolic for disinfecting the hives and frames, as their cleansing properties are so much better than it, and Behring has shown that 5 per cent. carbolic requires at least three hours at blood heat to destroy the spores of anthrax. In case the soap or the washing soda is used, however, it must be used as hot as possible. Of course anything which is of no value should be burnt.

I trust that in this paper I have thrown a little light upon some of the facts in connection with the disease of foul brood, but as I stated in the beginning, I reserve the privilege of submitting to you at a future meeting the results of next summer's work.

Before closing I desire to express my thanks to your able secretary, Mr. Holtermann, for the assistance which he has given me, and also to Mr. Corneil, of Lindsay, for advice and for the use of volumes of all the principal bee journals, which he has supplied me with, also to Mr. Larrabee, of Michigan Agricultural College, in connection with the subject of comb foundation.

WM. McEVOY: I am very thankful for that paper that Mr. Mackenzie read. I am pleased to think that we agree in so many things, and in time I think we will be agreed in all. In the first place, in going into the disease I like to give the cause cure and preventive. Where brood after brood has rotted in the same cell, and where the queen lays in that cell, and the young bee is fed in this corrupt cell, in time it will become diseased. If there was not so much dead brood there would not be so much foul brood. I know that a lot of uncared for brood does produce foul brood.

Next, to prevent it. I will take a foul brood hive and I will remove the disease. Now, you might say that is impossible, but I can cure it. First use the starters and then the foundation. The foul brood may break out again, but afterwards, when there is little or no honey coming in, when the foundation is small put them on the starters again. All the difference depends on the honey flow, how bad it was diseased, and the make of the foundation. Put them on the starters for four days, and when that is drawn out, drive the bees off, remove the starters, and give foundation. By the time this work is done the disease has gone. When you have a part of your bees diseased you should go in the evening, about sundown, to the diseased hives and remove the combs, shake the bees in their hives and give them starters. If you do this during the day, they will mix and start the disease in others. This disease can be cured in the honey season by the use of the honey extractor. The great difficulty is in getting the men to carry out instructions. Where a man has only a few hives and they are diseased, if he is busy at anything else he is not very particular, and the ones from the strong hives go and spead the disease to the others. Is the comb so costly or the foundation so dear that you must take old rotten combs and spray them? Spraying is not a success and never will be to the public. I know some places where they have tried it, and they could not have had a worse outbreak than when they tried it. That is my experience. I have examined eggs many a time, and there is more foul brood deaths at the age of 7, 8 and 9 days than at any other age. Now, if these were diseased, why did not they die in 2 or 3 days; But they run on 8 or 9 days.

Mr. Gemmell: Some claim foul brood cannot be cured in the honey. I have had some experience. and I have proven in every case that where you once get rid of the infected honey from the colony, whether or not you bale the hive, you can get rid of the disease. The first season that I had it, I baled all my hives. I had it in some cases in the second season, and I did not bale them, and got rid just as well. In regard to the queen being diseased, I may say that if the disease is in the egg, what is the use of trying to cure the bee?

Mr. Mackenzie: My opinion in regard to the infection of the ovary in the queen is that it is purely accidental. My method is as follows: I sterilize the whole upper surface of the bee, and I cut down through the top part and remove all the other organs except the ovaries and then sterilize the surface of the ovaries and put a hot needle into the centre and allow it to stay there until it is cold, and discovered in three out of five cases there had been foul brood spores on the inside. My explanation is that they can move, and have simply worked their way up here accidentally.

Mr. Gemmell: Do you think it is possible for the germs to be wafted from one hive to the other?

Mr. Mackenzie: Of course we know that in an infected cell you will find a good deal of the infected material down at the bottom of the cells, and as long as it is there I do not believe it would be wafted. Of course that is not an absolute opinion.

FACTORS NECESSARY TO THE ADVANCEMENT OF THE DAIRY INDUSTRY IN ONTARIO.

Following is an address delivered by Mr. John Hannah of Seaforth: After having heard so many very scientific addresses, I do not know but it would be quite a relief to have something off-hand for a little while. I may say that I had felt like apologising for not having my remarks in the form of a paper, knowing the advantage of that in a good many ways.

I am expected to give a few remarks to-day on dairying in Ontario. The dairy industry has been taking a good deal of prominence lately in Ontario, and I believe there is a goodly reason; in fact, there would be no difficulty at all in proving to this audience that it is one of the most important branches of Canadian farming to-day. We

find that grain raising, although we can perhaps get about as good returns to the acre as a few years ago, through a depression of prices is getting quite unprofitable. We find also that our live stock industry is being attacked. When we find these sources of our income curtailed we have got to look in another direction, and that direction, I think, is dairying, in one form or the other. We have at the present time three great sources of income from dairying as practised by the farmers of Ontario, cheese factories, creameries and private dairies. I will take them in the inverse order in which I have named them.

Private dairying, which largely takes the form of butter-making, I am happy to say, is receiving considerable attention, and through the enterprise of our Minister of Agriculture, we have now two travelling dairies in operation giving practical instruction as to the care of cream, making, printing and handling of butter, etc., and at the same time, capable men, such as Mr. Palmer and Mr. Linfield, are in charge of these dairies, giving the best information as to the selection, care, feeding of dairy cows, handling of milk, etc. In a great many parts of Ontario I have no doubt this will do a great amount of good. No matter how well a cow is fed, if the manufacturing of the butter is not properly done the dairy interest will suffer, but if the churning and handling of the butter is done uniformly it means a uniform product, and a uniform product means a uniform price, and the travelling dairies are doing considerable to bring this about.

The next point I would touch on is the cheese factories. I think that it was almost understood or claimed by the cheesemen tha t cheese-making in Ontario was at its highest point of excellence, but that there was room for improvement in butter-making. We had our name established in the Old Country for sending in the greatest quantity of an excellent quality of cheese that was received from any country. We had, too, the cheese factory proprietors and managers giving the returns that the individual farmers had been making from their cows and from their farms, showing that they were doing very well and were satisfied ; but since that time a little spirit of unrest has dropped in among these cheesemen. They find that they cannot run the factory more than about seven months of the year ; and we find that if we want to use a cow to the best advantage, we have got to keep her milking for more than seven months in the year. They should milk at least ten months, and if they turned the three months' milk into butter they were of course at the disadvantage of not having any good market for it. Of course the travelling dairy has been to a certain extent overcoming this difficulty, but that necessitates a good deal of expense and a good deal of labor at a time when the cheese factories were not running. The man that has gone into keeping many cows with the help that he usually has and milking from 15 to 30 cows and keeping them up every day—Sunday and Saturday— for six or seven months wants a comparative time of leisure if he can get it, and he will not get it if he keeps on the production of dairy butter for three months more. Now, if they can dispose of this milk for the other five or six months it would be a great advantage, and I think I may safely say that Prof. Robertson has the credit of first advocating, if it is a credit, the running of creameries in connection with the cheese factories, and in this way be able to make butter through the whole winter season and cheese during the rest of the year. I would throw out an idea to the cheesemen of how to run these winter dairies in connection with cheese factories. The idea has come from the other side, that is, having skimming stations and a central factory for making butter. We find that in any good cheese-making district there are cheese factories about every four miles. Take one central factory in a radius of from 8 to 10 miles and fit it up for butter-making, and then put in separators in the other factories within this radius, have the milk delivered at these factories, separated, and the cream brought to the central factory to be manufactured into butter. The advantage which I think we would find in this system is the economy in manufacturing. You know that the larger the quantity in a single factory the more cheaply and economically it can be manufactured, besides the benefit of having a larger quantity to sell. There is also further economy in the matter of machinery when you club the cheese factories together in this way. A separator can be put in at a very little expense over the cost of the separator. If you had to fit up each of these

factories for a creamery there would have to be a large amount expended in purchasing churns, butter-workers, etc., and another expense would be the paying of more butter-makers. Suppose you were in a district where you could get seven or eight factories to club together in the way indicated, all you would require would be one first-class butter-maker in the central factory There is no difficulty in any cheese-maker learning to run a separator, and I think you could engage the cheese-makers at the stations for the remaining five months of the year to run these separators. He could run the separator in the forenoon, three times a week, or oftener if the quantity of the milk were sufficient, and deliver the cream in the afternoon at the central factory, and in that way reduce the expense to the least possible amount. This system has been adopted on the other side of the line quite extensively.

I would like to speak about the marketing of cheese. The old country is a good market, and you can go to your board meetings at London, Ingersoll, Woodstock, etc., and you will get all it is worth on that market, but there is a market for a considerable quantity of Canadian cheese which I think is undeveloped, and that is the home market. I think there are very few who have any hesitation in saying that the cheese consumed at home is not first-class. Now, I think in Canada you would find we are prepared to pay a good price for a good article, and if we do not get the best article we do not want it at all; and this is one reason why our home trade in cheese is not larger than it has been, and I fancy that by making a nice cheese for our home market we will increase this trade to a great extent.

Now as to the creamery industry. This industry is comparatively in its infancy. We have had creameries running more or less for about 9 or 10 years, and even yet we have not very many in the Province of Ontario. One reason for that, no doubt, is that the cheese factories were established some 15 or 20 years earlier and have proved quite successful, and where they have been established there has been no object in changing by introducing the creamery. Some sections have creameries, however, and they have taken to the creameries simply because they can keep their skim-milk at home on the farm to feed their stock, and at the same time they are getting a fair price for the cream; and even though they should not show the same returns as from a cheese factory, still they have been satisfied to go on, and as far as I know from the present season's manufacture there has been a very marked increase in the quantity of butter from the creameries. I do not think this has been at the expense of the cheese factories, for I find there has been a very large increase also in the production of cheese. The creameries in Western Ontario have been nearly all, so far, conducted on the cream-gathering process. It has some serious defects, and I fear that we are not going to be on the right track until we get that changed for the separator system. My reasons for that are that in the cream-gathering system the creamery managers are too much at the mercy of the farmers; and where you have to depend on so many they do not take sufficient care in attending to the cream properly, and we sometimes get cream in condition that is not favorable to making the best quality of butter. Another advantage in the separator system is that you are able to make a complete separation of the cream from the milk, and thereby the returns can be made to the farmers for the whole of the butter, while with the gathered cream system you have from 15 to 25 per cent. left in the milk. With regard to the skimming stations there is the great advantage of having the whole of the cream taken out of the milk; there is also the advantage, when you have the skimming stations placed close together, of not having very far to haul the cream to the factory, and the skim-milk can be returned in fairly good condition to feed to the hogs or calves. With these advantages I do not see why our creamery industry should not be supported, as in many sections where they want to raise the young stock it could be followed with advantage. I think it will be adopted to a considerable extent when known. One of the great difficulties, however, is the expense; the separators are very costly, but there is no doubt that in a very short time the price will be reduced. I believe it has been reduced fairly well during the past year. I think that with this system we will be able to induce a larger number to go into the creamery system, and we will be able through that means to get an increased export supply of butter, for which there is a fairly good demand at all times in the Old Country as well as in our own

western countries. British Columbia has been getting quite a lot of our butter for the last few years. Exports from Montreal to England during the past season have doubled as against last year, and we still have room there for any amount of butter. The market there is a very profitable one if you put in the right quality. There is one factor with regard to the advancement of the dairy industry in Ontario which I think is the most difficult to get, that is to get the farmers to understand that it is going to be profitable to go into dairying. One difficulty is that they have not realized the possibilities of the profit in the way of milk production. They are satisfied to milk for seven or eight months in the year, and after that they allow their supply to dwindle down until it is next to nothing, and through that means they do not get anything like what they should get from a cow. The only way that we are ever going to get these men into line and to make dairymen worthy of the name is to keep on educating them and to get them to interest themselves. I think a good work could be done by the Babcock test. I was doing a little work myself with a Babcock test this season, and we paid according to that test, which I hold is the proper way. I got a private one for going around among patrons and tested their cows for them, and it had the effect of opening their eyes to the folly of keeping some of the cows that they were keeping. We all know that there is no profit in keeping a poor cow.

Prof. DEAN: I would offer a few thoughts along the line that Mr. Hannah has spoken. There is a mistaken idea in the country that private dairies are antagonistic to creameries,—that if you go around teaching men how to make private butter, you will ruin the creameries. The facts are, that there are more creameries being established this year and the next year than have been established during the last 10 or 12 years in this province. Under the heading "Items" from Belleville, I read the following: "Since the travelling dairy has been in this section the results are that two or three cheese factories are putting in apparatus for making butter." The private dairy is the forerunner of the creamery. You cannot change from grain-growing to dairying in a day or two—you cannot get the cows; so people must go into the private dairying before creameries can be established to any great extent. Mr. Hannah also spoke about changing cheese factories into creameries during the winter. There have been a great many of these established during the last season—I think there were only two or three last year, but now about 20 or 30. He also referred to the fact that we might develop a home market for our cheese. It is a lamentable fact that if you go into the best hotels in the province of Ontario you cannot get cheese fit to eat. What is the reason for that? If a cheese maker makes a poor lot of cheese, he keeps that back when he sells to the buyer for the English market; and consequently our store-keepers get this poor cheese. If we say that we will not eat this poor cheese, the maker will be compelled to dispose of it in some other way. I think that the gathered cream system is going out of date, because from tests made in all parts of the Province, we find that farmers are losing from one-half to a pound of butter in every hundred pounds of milk. Can we afford to feed 23 cent butter to calves and pigs? I think there is more money in taking that out of the milk. We have found that unless the room in which the cream is set is cooled down to 45 degrees we do not get a clean skimming; and I think, taking it all the year round, that those who use the creamery cans loose from 20 per cent. to 25 per cent. of their butter. There are, however, certain advantages in the cream-gathering system: one is less cost in hauling to the factory. A drawback to the cream-gathering system is that they have all the work but churning the cream to do on the farm; and it really does not make much less work than when they manufacture the butter at home.

If it were not for the fact that the creamery men were able to get a better price for their butter, I do not think they would run at all. I am satisfied that in the next two years we shall see the separator plan coming into almost universal use. There are certain factors necessary to the advancement of this dairy industry. In the first place, we must get at the men who are managing the cows and supplying the cream. If we cannot get the people to come to these meetings, then we will have to go to the people, and instead of having these large meetings we will have to divide up and have dairy association meetings in every county. We want more local associations and get at the men who are producing the milk on the farm. I am also satisfied that we need to get a better class of

cows. It is said that the average cow gives but 3,000 pounds of milk per year. If that is a fact, it means that the average cow does not pay for her keep and the trouble and expense of looking after her. The standard I take is 6,000 pounds of milk, or 250 pounds of butter, and that is a standard which should be put up in every dairy stable in this country. How are we to get this standard? The only way to do it is for every man to put a pair of scales in his stable and have a tester on the farm or at the cheese factory. We weigh the milk from each cow every night and morning, at the end of the week we record these weights in a book kept for the purpose, and twice a week we take a sample from each cow and test it. Until the dairymen of this country adopt some such method as this, we will not see much improvement in our dairy industry. First, then, get at the men; secondly, get a better lot of cows; and the only way to get them is to find out which are the best and breed them to pure bred sires, and in this way we will see a great improvement in our dairy industry in the next five years.

ADDRESS BY MR. MULOCK, M.P.

Mr. W. Mulock M.P., Vice-Chancellor of Toronto University, was then introduced and spoke as follows: I came here to-day on the invitation of the Secretary of this Union both for the pleasure of meeting men engaged in this industry and also to see the work done here by this College under the able management of your President, Mr. Mills. I can hardly claim to be a practical farmer, and think it a mistake to expect to find too many qualities in one man. For example, I saw an advertisement in a paper by an Australian ranchman who advertised for a university graduate to take charge of his children, but added in the postscript that he must be able to milk goats. (Laughter). That branch has not yet found a place on the curriculum of the University. Speaking of dairying, my experience has been that in order to successfully carry on dairying, we should soil in summer as well as in winter. Therefore, it appears to me that in connection with this institution it would do well to give instruction as to the best system of soiling. I have practiced it for six years, and my experience with a herd of between 20 and 30 cattle has been that I never had my cattle flourish so well and fed so cheaply and with so satisfactory results. If I can do nothing more, I can give that little bit of experience in my limited way as a farmer, and ask that the traveling dairies give attention to this subject if it is thought worthy of attention.

I am a supporter of the Ontario Government, and I am rejoiced to see that they are doing what they are for the Agricultural industry; and I am not a fault-finder as a rule, but as a taxpayer I venture to criticise to some extent the unnecessary degree of economy in my judgment that I see manifested in connection with certain of the works of this institution. I believe the farming industry is of sufficient importance in Ontario to be entitled to a larger support, and it is unwise to stint this Farm and College in any respect, and if I were to go over this whole scheme accurately, I think I could point out where public money could be used to advantage in equipping the different departments here to the desired extent. It is my pleasure to encounter throughout the Province many of the graduates of this College, and I find them taking prominent positions where they live. There are several in my riding taking much interest in the great field of agriculture, aiding in the advance of the science and becoming the means of disseminating amongst their neighbors much valuable information. Such work is of incalculable advantage to the country, and the Legislature cannot too fully appreciate the importance, therefore, of affording every facility in this institution for the youth of this country becoming educated in scientific farming. Of course it is gratifying to know that the institution is being well filled with students and that more are demanding admission than the facilities can accommodate; and I would say to the management and to our able President, Mr. Mills, that this result is more complimentary to them, is testimony of the good work they are doing for the Province; and I think it is the duty of the Government to see that the doors of this institution are not closed to any worthy student who knocks

for admission. Mr. President, you call upon me without notice, and perhaps I, therefore, speak more unguardedly than I would otherwise have done. I am speaking in the presence of a Minister of the Crown, and I trust that he will not altogether censure me for making these assertions. I know that his heart is in the work, he is a practical farmer, and I rejoice to know that he has been the means of doing great good to the province. With him has originated, if I am correctly informed, the idea of carrying out this progromme of instructing the farmers in dairying; and if he never lives to do anything more in his public life than that he will have deserved well of his country. The dairying interest is a great and growing interest, and the people throughout the country are in a fever on the subject. All over the country there is a thirst for information how to successfully carry on the dairy industry, and that cry is brought forth to a great extent through the Minister of Agriculture and his endeavoring to supply that want. Therefore, I say the name of John Dryden will ever be remembered with gratitude by the people of Ontario for the part he has taken in furthering the dairy interests of this Province.

I am glad to be here to-day and to compare what I have seen during my wanderings this afternoon with the condition of affairs a few years ago. It is a progressive age, and without finding fault with anything in the past, I think I can compliment the management of his Institution upon the progress that has been made. It is gratifying to know that it is manned by live, energetic men who are also to be found ready whenever required to go out to deliver lectures and otherwise disseminate such information as they may have among the farmers of this fair Province. I have met several of the professors of this institution outside of their engagements here, and I have had a feeling of sympathy and pity for them at the amount of work exacted from them by that severe task-master, the general public; and again meeting them here and finding them always at work, I say that the Ontario Agricultural College deserves well of the people, and demands at the hands of the Government the most liberal treatment that the circumstances of the people warrant.

ANNUAL SUPPER.

After the close of the afternoon session, President Mills invited all the ex-students and other visitors present, to join the College officers and students in the dining hall, to partake of the matron's hospitality. After supper was served, various toasts were proposed and fittingly responded to by members of the Union and by visitors, among whom the following may be mentioned: Hon. John Dryden, M.P.P., Wm. Mulock, M.P., Messrs. C. C. James, F. T. Shutt, and J. J. Mackenzie. A very enjoyable evening was thus spent.

SECOND DAY.

The first business taken up after roll call on the second day, was the report of the Nominating Committee.

Moved by E. Lick, seconded by S. P. Brown, that Article IV be amended to read as follows: "The officers of this Association shall consist of an honorary president, president, vice-president, treasurer, secretary, editor, two auditors, one corresponding secretary for each county, and such committees on experiments as may be found desirable, who shall hold office for one year, or until successors are elected." Carried.

Moved by E. Lick, seconded by R. F. Holtermann, that Article VII become Article VIII, and that Article VII read: "The treasurer shall pay out all money held by him only on order of the President." Carried.

After some discussion as to the best method of inviting farmers generally to the Annual Meeting, President Mills offered to instruct the heads of the different deputations attending the Farmers' Institutes, to give a general invitation to those present at each of their meetings to attend said meeting.

OFFICERS FOR 1893.

Honorary President	Prof. A. E. Shuttleworth, B.A.Sc., O. A. College, Guelph.
President	A. G. McKenzie, Fairview, Ontario.
Vice-President	A. R. Yuill, Carleton Place, Ontario.
Treasurer	H. L. Hutt, B.S.A., Southend, Ontario.
Secretary	R. F. Holtermann, Brantford, Ontario.
Editor	C A. Zavitz, B.S.A., O.A.C., Guelph.

AUDITORS:

Jas. Atkinson and C. M. Macfie.

DISTRICT OR COUNTY SECRETARIES.

Name.	County.	Post Office.
W. A. Mattice	Stormont	Cornwall.
W. L. Carlyle	Dundas	Chesterville.
G. G. Shirreff	Russell	Clarence.
E. G. McCallum	Glengarry and Prescott	Martintown.
J. C. H. Sparrow	Carleton	Antrim.
P. McLaren	Lanark	McGarry.
W. Lindsay	Renfrew	Loch Winnoch.
J. C. Stagg	Leeds and Grenville	Brockville.
B. C. Brown	Frontenac	Kingston.
D. Aylsworth	Lennox and Addington	Bath.
D. H. Leaven	Hastings	Belleville.
W. M. Newman	Prince Edward	Gilbert's Mills.
Wm. Wiancko	Muskoka	Sparrow Lake.
Wm. Morrison	Haliburton	Minden.
F. J. Davidson	Peterborough	Peterboro'.
W. Carlaw	Northumberland	Warkworth.
J. L. Fair	Durham	South Monaghan.
T. H. Tinny	Victoria	Oakwood.
S. P. Brown	Ontario	Whitby.
R. A. Thompson	Simcoe	Thornton.
G. A. Brodie	York	Bethesda.
J. A. B. Sleightholm	Peel	Humber.
W. Ewing	Dufferin	Mulmur.
E. P. White	Grey	Clarksburg.
A. R. Vannater	Wellington	Ballinafad.
H. Black	Halton	Scotch Block.
H. L. Beckett	Wentworth	Hamilton.
J. Harcourt	Lincoln	St. Anns.
A. M. Soule	Welland	Southend.
D. Z. Gibson	Haldimand	Willow Grove.
Allen Shantz	Waterloo	Waterloo.
G. C. Emigh	Oxford	Holbrook.
G. N. Hunter	Brant	St. George.
B. E. Kitchen	Norfolk	Waterford.
Jno. Buchanan	Huron	Hensall.
N. Monteith	Perth	Stratford.
J. B. Muir	Bruce	North Bruce.
E. M. Husband	Middlesex	Cairngorm.
C. R. Stevenson	Elgin	Fingal.
N. J. Clinton	Essex	Windsor.
B. Robinson	Kent	Wheatley.
A. E. Wark	Lambton	Wanstead.

Delegate to Central Farmers' Institute, C. A. Zavitz.

COMMITTEES ON EXPERIMENTS.

Agriculture.—President Mills, Prof. Shaw, Prof. Shuttleworth, C. A. Zavitz, H. Story, A. M. Soule, G. Y. Payne, R. Shaw, Jas. Atkinson, R. Harcourt.

Horticulture—E. Lick, N. Monteith and H. L. Hutt.

Dairying.—Prof. Dean, S. P. Brown and W. J. Palmer.

Apiculture.—R. F. Holtermann, E. M. Husband and N. Monteith.

Economic Entomology.—Prof. J. H. Panton, H. L. Hutt and Jas. Atkinson.

TREASURER'S REPORT.

	Dr.	Cr.
	$ c.	$ c.
To amount on hand	162 54	
" Membership fees	15 00	
" Government Grant	400 00	
By expenses of speakers (at meetings)		74 80
" grains, fertilizers, printed forms, expressage, etc. (for experiments in agriculture)		301 99
" potatoes, printing, posting, etc. (horticultural experiments)		36 19
" foul brood, printing, posting, etc. (apiculture experiments)		23 00
" Secretary's salary, ($15 for 1891)		40 00
" travelling expenses of officers		9 20
" reporting meeting, editing report, printing circulars and programme, postage, etc.		90 05
" balance on hand		2 31
Total	577 54	577 54

We, the undersigned, auditors of the Ontario Agricultural and Experimental Union, beg leave to say that we have examined the accounts of the Treasurer for the past year, and have found them to be correct.

Signed { J. Atkinson, H. Story.

O. A. College, Guelph, December 22nd, 1892.

REPORT OF THE HORTICULTURAL COMMITTEE.

Presented by Elmer Lick, Oshawa, Ontario.

The committee, after consultation, thought best to continue the experiment with new and promising varieties of potatoes. It was also decided to drop Puritan, Crown Jewel and Thorburn, of the previous year, and substitute Harbinger, Toronto Queen and Burpee's Extra Early. The following circular was sent out in April :

Oshawa, April , 1892.

Dear Sir,—It has been decided by the Horticultural Committee of the Ontario Agricultural and Experimental Union, to carry on the following experiments with potatoes: Testing new varieties with a view of arriving at correct conclusions as to the earliness, productiveness and quality. Five pounds of each will be sent to each experimenter, free of all charges. Each variety must be cut to 99 pieces and planted uniformly on six rods of row.

Each experimenter is also asked to select his own best yielding variety and treat in a similar manner. The rows are to be adjoining and the soil as uniform as possible. Send the weight of entire crop. In digging be careful to weigh accurately, and forward results on blank form before November 10th, to

Elmer Lick.

N.B.—Those who carried on experiments last year are expected to take five pounds of their own growth of each variety as well as the three new ones and report results. In cutting potatoes to 99 pieces cut larger ones first ; endeavour to secure as uniform size of pieces as possible. If you wish to undertake experiment, send postal card as soon as you receive this, stating post office and express office.

Owing to the very unfavorable season, a considerable number of experimenters failed to secure reliable results. The large rainfall in June, followed by dry weather and rust, or blight in many cases, deterred the experimenters from keeping record of the different varieties. Notwithstanding this, we are pleased to report that we have twelve complete and satisfactory reports (with the exception of Empire State in W. H. Foster's report). This, however, has been calculated in with the average results, as it did not alter the relative positions of the varieties. The following table shows the average weight of each variety per plot and estimated yield per acre.

At the bottom of the table the results of three experimenters whose reports were not satisfactory to themselves, and therefore not worthy of a place in average, are given.

Experimenters.	Empire State.		Summit.		Rural No. 2.		Toronto Queen.		Burpee's Extra Early.		Harbinger.		Distance of rows.	Soil.	Date of planting.
	Total weight.	Small.	Total weight.	Small.	Total weight.	Small.	Total weight.	Small.	Total weight.	Small.	Total weight.	Small.			
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb	lb.	lb.	lb.	lb.	in.		
Samuel Rankin	110	....	92	....	61	....	56	....	50	....	43	....	36	Clay.	May 30.
H. L. Hutt	49	12	51	11	55	8	35	18	32	15	30	15	30	Loam.	June 7.
Walter S. Clapp.....	115	17	98	18	97	8	68	32	66	33	69	30	42	Sandy Loam.	June 2.
James Watson.....	105	6¼	76	5¾	100½	3¾	10½	8½	75¾	11¾	41½	2¼	36	Clay.	May 27.
W. H. Foster	30	15	79	13	65	6	86	14	52	11	99	20	44	Sandy Loam.	May 28.
N. Monteith	150	36	132	30	72	18	90	30	90	33	63	18	30	Clay Loam.	May 30.
Ben. Shirreff.....	183	21	115	15	120	12	64	5	122½	35½	40	25	34	Light clay Loam.	May 10.
S. H. Rittenhouse.....	165	5	131	12	139	2	116	9	103	18	70	10	36	Sandy.	May 30.
Geo. G. Shirreff	77	15	93½	16½	64½	20	89	9	114	22	56	18	34	Gravelly Loam.	May 25.
D. K. Erb.....	60	27	75	26	59	9	54	24	76	11	38	25	26	Loam.	May 28
G. F. Blaney	80	....	76	....	54	....	111	....	118	5	111	27	36	Loam.	April 26.
Thos. Steadman	85	9	109	12	137	2	87	10	89	9	57	11	34	Loamy clay.	May 21.
Average yield of one row 6 rods long ...	100¾	13.6	93.9	13.2	84.7	7.6	77.2	13.3	82.4	17.0	59.7	16.8			
Yield per acre.....	253.6 bu.		236 3 bu.		213.3 bu.		194.3 bu.		208.3 bu.		150.0 bu.				
Wm. Bailie	100	20	45	20	89	18	50	16	45	15	70	16			
E. B. Edwards.....	40	....	40	....	30	....	15	....	36	....	17				
Jas. Forsyth	...	..	.....	.....	.....	.....	141	19	102	17	62	18			

The next table shows the yield per plot of the other varieties grown by the experimenters in pursuance of request to grow best yielder, and also those varieties sent out last year.

Experimenter.	Varieties.	Total Weight.	Small.	Experimenter.	Varieties.	Total weight.	Small.
		lb.	lb.			lb.	lb.
Samuel Rankin.	Clark's Seedling	125	....		Puritan	103	7½
H. L. Hutt.....	Late Hebron ..	62	11	Geo. G. Shirreff	Crown Jewel .	86½	15
Walter S. Clapp.	Rural Blush ..	104½	....		Thorburn.....	88	11½
	Puritan	78	25		Dakota Red..	80	4
James Watson..	Everett's Seedling	104¼	5¼	D. K. Erb	White Elephant	74	8
N. Monteith ...	White Elephant	140	35		White Star...	79	5
B. Shirreff.....	Late Hebron .	110	8		Late Rose	70	8
	Bell	112	5		Puritan	73	2
	Farmer's			G. F. Blaney, jr.	Crown Jewel .	76	....
S. H. Rittenhouse	Favorite ...	137	4		Thorburn	85	....
	Ideal	132	2		Early Puritan	89	9
	White Star...	103	3	Thos. Steadman.	Crown Jewel .	91	10
	Rural Blush..	146	4		Thorburn	79	9

Showing average period of growth and reported mealiness and quality of each variety.

	Empire State.	Summit	Rural No. 2.	Queen.	Burpee's Extra Early.	Harbinger.
Average number days from planting to maturity...	109	102	107	95	87	102
Mealiness .. Good	7	7	5	7	8	4
Mealiness .. Medium	3	3	5	3	2	4
Mealiness .. Bad	..	..	..	..	..	2
Quality .... Good	7	6	7	7	8	3
Quality .... Medium	2	3	2	2	1	5
Quality .... Bad	..	..	.	..	..	1

Remarks of Experimenters.

Samuel Rankin, Fairview, Perth Co.: They are all good eating potatoes. We have the Daisy: it is best in quality but not as good a yielder. This was not a good year with us, being too wet for clay. You will notice that Clark's Seedling is the best yielder. It is a new variety but a fine potato and good table quality also.

H. L. Hutt, Southend, Welland Co.: Of the early varieties Burpee's Extra Early is one of the most promising, while in late varieties Rural No. 2 is my favorite, being uniform large potatoes of good quality.

Walter S. Clapp, Rose Hall, Prince Edward Co.: I think it is unfair to the early varieties, and with the six kinds I should make but little difference for table use; but all I would want of Rural No. 2 and Rural Blush would be for feeding purposes. Potatoes are a very poor crop here this season.

James Watson, Sonya, Durham Co.: The yield of Harbinger was small on account of bad seed, only one-half growing. Empire State was the best yielder, but tubers very rough and subject to rot, one-half being useless. Rural New Yorker is an all-round good potato, very smooth and free from rot. The other three varieties very good. Everitt's Seedling is the best of the seven varieties.

W. H. Foster, Leamington, Essex Co.: Too much rain in the fore part of the season and too dry at the time of setting. No rotten ones. Empire State inclined to be rather rough in shape.

Nelson Monteith, Stratford, Perth Co.: The season was very unfavorable for a good report, the extreme wet weather during June almost destroyed the potato crop in this locality. The tops upon most varieties kept green until the middle of September, when a blight appeared to affect them, and consequently rot tended to decrease the yield. Rural No. 2, Harbinger, and White Elephant were most affected by the rot. Empire State, Summit and White Elephant were smooth and free from scab.

Benjamin Shirreff, Allenford, Bruce Co.: The blight affected all these potatoes early in August else I believe the results would have been much greater, especially in the late varieties. I do not think they ripened; they were killed with blight. They were all completely dead by Sept. 1st.

S. H. Rittenhouse, Jordan Station, Lincoln Co.: According to test plot the Empire State are ahead of all the others; their size the only point against them. Farmer's Favorite are my main cropper: they resemble White Star. Cannot say much in favor of Rural No. 2. I also tried them in the field.

G. G. Shirreff, Clarence, Russell Co.: Burpee's is first over all with a large percentage of small ones, while Puritan is best of varieties sent last year with the lowest percentage of small. Harbinger takes lowest place of the nine with the largest percentage of small, and Rural No. 2 holds that place among those destributed in '91 with the 2nd highest percentage of small. None of the varieties show any appearance of rotting up to the present, nor were any showing signs of ripening when the rust came on them and all perished together. Were well manured with farmyard manure and had also an application of wood ashes, superphosphate, sulphate of ammonia. Killed with rust in the 1st week of August.

D. K. Erb, Sebringville, Perth Co.: Some of the new varieties had a great many potatoes in the hill, but there were so many small ones. This perhaps may be partly owing to the very wet weather previous to July 1st, succeeded by a very dry spell, which rendered the soil very hard.

G. F. Blaney, Jr., Oshawa, Ontario Co.: The whole of the above varieties turned out good, with the exception of the Summit, which rotted very much. The season was very wet for potatoes.

Thos. Steadman, Wyoming, Lambton Co.: This has not been a favorable season. My crop was away above the average. Harbinger and Queen are good quality. All the late kinds had a few of the biggest potatoes rotten, and the season was not favorable for early kinds.

Conclusions.

1. It is a very difficult matter to arrive at definite results owing to the season. Yet in view of last year's results (see Agricultural College Report, 1891, pp. 224-226) we see that the two varieties which were ahead last year again stand first, only the order is changed, Empire State occupying first place and Summit second. Empire State yield, 1892, 253.6 bush. per acre, and in 1891, 290 bush. per acre. Summit, in '92 236.3 bush., and in '91 329.2. In view of these results, it certainly should indicate that these two varieties are ones most likely to succeed in Ontario.

2. Rural No. 2 has not fulfilled expectations of one year ago, probably a result that should be attributed to the blight. It stands third in yield.

3. Of the three new varieties, Burpee's Extra Early has shown itself to be an excellent early variety, ourth in yield, earliest of the six varieties, and best in mealiness and quality.

Prof. PANTON: Did the blight affect both your early and late potatoes in the same way?

Mr. LICK: Our potatoes died in very much the same way. Up to the time our barley was ready to be taken to the barn we had very excellent weather, but at that time it became very wet, and it was during that time the blight struck the potatoes, and when we dug them there were quite a good many starting to rot, but since they have been taken up there is not much sign of rotting.

Prof. PANTON: We discovered an interesting thing in connection with potato rot. In the examination of some potatoes found rotting at the College this fall, I observed the cause was largely due to the fungus *Fusisporium colani*, a parasitic plant which is more likely to attack the potato late in the season; while the common potato blight (*Phytophthora infestans*) appears early. The blight which struck Mr. Lick's field was likely caused by an attack from some species of bacteria.

Mr. LICK: Do you consider that the eyes from the seedy end of a potato are better than from the main body of it?

Mr. HUTT; I would not say that they are better. They might, however, be better in this way: the seedy end of a potato will make a little earlier and more vigorous start in the spring.

Mr. LICK: We have experimented along that line, and found as a result of planting the seedy ends that we get a less quantity of potatoes and a greater percentage of small ones.

Mr. ZAVITZ: We have been experimenting with potatoes here to a considerable extent. In 1890 we had 35 varieties, and the Empire State came to the head of the list, and in 1891 the same variety came to the top of the list again. For three years the Empire State has been at the head of the list and the Summit second. It is very gratifying to see how experiments here correspond with the experiments over the Province. I may say that we have been carrying on experiments this year in regard to planting potatoes in different ways. We put in large whole potatoes every foot, one every two feet and one every three feet; medium whole potatoes every two feet and every one foot; small whole potatoes every foot; medium potatoes, cut in half; medium potatoes, two eyes in a piece; medium potatoes, one eye in a piece, and the seed ends from medium potatoes, and the results show that the smallest yields were obtained from the seed ends. All things considered, we got the best yields from medium whole potatoes put in 2 feet apart, but that is the experience of one year only.

REPORT OF EXPERIMENTS IN AGRICULTURE.

PRESENTED BY C. A. ZAVITZ, B.S.A., AGRICULTURAL COLLEGE, GUELPH.

Co-operative experiments in agriculture have been conducted during the past year by seven hundred and fifty-four ex-students of the College and other farmers throughout Ontario. The number of plots used for this work was upwards of five thousand, and the Committee was unable to supply all the applicants for seeds and fertilizers owing to the great demand. The number of experimenters is increasing about 50 per cent. each year, and much interest is being manifested in the work. Although the season was somewhat unfavorable owing to the excessive wet weather, still the Committee has reason to feel much encouraged by the good number of successfully conducted experiments, the reports of which have been received. With but one exception reports of successful and interesting experiments came from every county in Ontario during the past year.

About fifteen hundred copies of the following circular letter were sent out in the spring of 1892.

DEAR SIR,—The members of the Ontario Agricultural and Experimental Union, along with other interested farmers over Ontario, are carrying out a system of co-operative experiments in agriculture. This work was started, upon the present plan, in the spring of 1886, with twelve experimenters, who were willing to receive the grains and fertilizers, carry out the necessary instructions, and report the results at the close of the season. For the first two or three years the experiments were confined almost entirely to the ex-students of the Agricultural College, but as many other farmers expressed a desire to join in the work the invitation was extended to them also, and material was sent free to those who applied, on the condition that they would be careful to follow the few necessary instructions and report results of their work after harvest. The number of both the experimenters and the experiments have steadily increased since the ommencement, insomuch that during the past season upwards of two thousand five hundred plots over Ontario were used for these tests.

The members of the Committee on agricultural experiments are pleased to state that for 1892 they are again preparing to introduce into every township of Ontario material for experiments, with fertilizers, fodder crops and promising varieties of roots and grains. Upwards of six hundred varieties of roots and grains were tested at the Experiment Station, Guelph, during the past year, consisting of nearly all the Ontario varieties and about three hundred new varieties imported during the past five years from different parts of Europe, Asia, Africa, New Zealand and the United States. Some of these varieties are certainly very promising and are now in sufficient quantities for a limited distribution.

The experiments chosen for 1892, are as follows:

No.	Name of Experiments.	Plots for each.	Size and shape of each plot.
1	Testing nitrate of soda, superphoshate, muriate of potash, mixture, and no manure with oats	2	2 rods x 2 rods.
2	Comparing the advantage of nitrate of soda over no fertilizer with rape	2	2 " x 1 "
3	Ascertaining the relative value of three varieties of millet	2	2 " x 1 "
4	Growing lucerne as a crop for fodder	1	4 " x 4 "
5	Testing six promising varieties of fodder-corn	6	1 " x 1 "
6	Testing five promising varieties of turnips.	5	1 " x 1 "
7	Testing five promising varieties of mangels	5	1 " x 1 "
8	Testing five promising varieties of carrots	5	1 " x 1 "
9	Testing six promising varieties of spring wheat.	6	1 " x 1 "
10	Testing six promising varieties of barley	6	1 " x 1 "
11	Testing six promising varieties of oats	6	1 " x 1 "

Prosperous farmers need not find much difficulty in conducting any of these experiments successfully, but care will certainly need to be exercised in every instance, and where this is done the Committee feels assured that the experimenters will be far more than repaid for time and labor expended. Each experimenter will glean information from his own work and also have the benefit of the reports of similar experiments from other parts of Ontario. The results of carefully conducted experiments are presented at the Annual Meeting of the Association, held at the Agricultural College, Guelph, and are afterwards printed in its Annual Report. Each experimenter is invited to the meeting and has forwarded to his address a copy of the Union Report.

A sheet of instructions for the work, and blank forms on which to report results of the tests will be furnished to each experimenter at the time the fertilizers or seeds are forwarded. All material is sent entirely free of charge to each farmer who wishes to join in the work. The produce of the plots, of course, becomes the property of those who conduct the experiments.

Each person is allowed to choose any one of the eleven experiments mentioned above, for which the material will be furnished until our limited supply becomes exhausted, hence those who apply first will be the surest of the desired outfit.

Those desiring to conduct an experiment during 1892, will kindly apply to the Secretary of the Committee as soon as possible, that the material may reach them in good time for seeding. The nearest express office to those applying for No. 1 experiment should be mentioned.

The demand for the experimental material was beyond our expectation, and we were kept busy in filling the many orders. Great care was exercised in sending out none but seed of good quality, nearly all of which had been grown upon the experimental plots at this Station. It is a satisfaction to be able to state that although upwards of 5,000 packages of seeds and fertilizers were distributed over Ontario for these co-operative tests, we have not yet had a single complaint regarding the quality of the seed sent or the manner in which it was packed. We believe in sending material of high quality, even though the quantity may of necessity be small in some instances.

Each experimenter was furnished with the essential instructions for carrying out the various tests, and also with blank forms on which to report the results of his work at the end of the season. These along with the following letter were sent to the experimenters at the same time the material was forwarded:

AGRICULTURAL COLLEGE, GUELPH, March 30th, 1892.

DEAR SIR,—Your reply to our letter regarding the co-operative experiments for Ontario during 1892 has been received. We wish to inform you that we are forwarding to your address the material for the experiment or experiments which you chose from the list in the letter we sent to you. If you have asked for No. 1 experiment, the material is addressed to your nearest express office; but if your application calls for any of the other experiments, the material is forwarded to you by post. This sheet gives the "Instructions" for conducting, and the "Blank Forms" on which to report the results of the different experiments with fertilizers, fodder crops, roots and grains. Should you desire any further information regarding your experimental work, kindly write us to that effect.

For each experiment, soil of a uniform character should be chosen, and the plots should be so located that there would be no danger of trespassing by poultry, etc. The preparation of the soil should be similar to that for the same crops in the larger fields.

We hope the material which we have forwarded will reach you safely, and that you will have good success with your experimental work.

I—TESTING FOUR DIFFERENT FERTILIZERS, AGAINST NO FERTILIZER, WITH OATS.

1. Upon uniform land, which has received no manure for at least four years, mark off five plots of one fortieth of an acre each, leaving a clean path, three feet wide, between the plots. Two rods square is the size recommended.
2. Treat all plots alike as regards cultivation of ground, etc., and sow the packages of Bavarian Oats upon the five plots, as indicated by the labels on the bags. Aim at seeding one inch deep, and cover the seed by going crosswise over the plots with a light harrow, or by using a hand rake.
3. Apply the fertilizers upon their respective plots, as indicated by the labels on the bags.
4. When the plants are three or four inches high, cut off all those outside of the plot limits.
5. Your safest method of harvesting would probably be to cut the crops with a cradle after the oats have become sufficiently ripened, and then, when properly dried, thresh with a flail.

Individual results of seven experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Weight of oats per plot.				
					Mixture.	Nitrate of soda.	Muriate of potash.	Superphosphate.	No fertilizer.
					lb.	lb.	lb.	lb.	lb.
Geo. Carlaw	Nort'mb'land	Clay loam.	Winter wheat	15 loads in 1888	58	54	50	47	52
A. W. Peart	Halton	Black "	Mangels	No manure, cropped 30 years	54½	54½	54½	60	58
Herbert Elford	Huron	Sandy "	Winter wheat	None	35	34	31	32	28½
John A. Smithson	Peterborough	Clay "	Barley	f. y. m. '88	37⅓	43½	33	30	30½
Thomas Wheatley	Grey	Clay "	Hay	15 years ago	42	40	38	34	36
Elmer Lick	Ontario	Clay "	Hay	15 years ago	39½	33¼	26¾	24¼	15
Henry Coben	Peterborough	Sandy "	Peas	18 years without	49	26	28	25	20

Average results of seven experiments.

Fertilizer.	Average of seven co-operative tests.		Experiment Station list.	
	Mixture.	Nitrate of soda.	Muriate of potash.	Superphosphate.
	tons.	bush.	tons.	bush.
Mixture	1.44	53.0	2.5	68.3
Nitrate of soda	1.39	47.9	2.6	70.3
Muriate of potash	1.26	43.9	2.0	67.4
Superphosphate (mineral)	1.15	42.4	2.1	68.2
No fertilizer	1.17	40.3	1.9	61.5

The "mixed fertilizer" was made up of nitrate of soda, muriate of potash and superphosphate, in the proportion of 1, 1 and 2, respectively by weight. The muriate of potash and the superphosphate were applied at the time of seeding, and the nitrate of soda when the plants were about two inches high. The following table shows the amount applied and the cost per acre of each fertilizer :

Fertilizer.	Quantity applied per acre.	Cost per acre.
	lb.	$ c.
Mixture	213	4 35
Nitrate of soda	160	4 40
Muriate of potash	160	4 48
Superphosphate	320	4 16

Under the term "cost per acre" neither the freight charges nor the expense of applying the fertilizers is included. The material for this experiment was all obtained in Ontario.

Conclusions.

1. The average results obtained by seven experimenters over Ontario in 1892 show that the fertilizers increased the oat crop as follows : Mixture—grain, 12.7 bushel ; straw, .27 ton. Nitrate of soda—grain, 7.6 bushel ; straw, .22 ton. Muriate of potash—grain, 3.6 bushel ; straw, .09 ton. Superphosphate—grain, .9 bushel ; straw, .02 ton.

2. The mixed or "complete" fertilizer gave an average increase yield of 31.5 per cent.; the nitrate of soda 18.8 per cent., the muriate of potash 8.9 per cent. and the superphosphate 5.2 per cent. of oats, over no fertilizer.

3. The grain crop was more than doubled upon some soils by the use of the fertilizers, while upon others it was influenced to a very limited extent.

4. Some soils may be more benefited by one kind of fertilizer, and other soils by another class of fertilizers, as for example, upon one farm the mixed fertilizer increased the yield of grain 23 per cent., and the nitrate of soda 43 per cent., and upon another farm the increased yield of grain for the mixed fertilizer was practically the same as in the first instance, while that from the nitrate of soda was but 19 per cent.

5. In five experiments out of seven, the mixed fertilizer gave the highest yield of grain per acre.

6. The greatest average length of straw was obtained from the application of muriate of potash, the second greatest length from superphosphate, and the shortest length of straw from no fertilizer.

7. The average crop which had received the mixed fertilizer was the first to mature, that which had received superphosphate was second, and the unfertilized crop was the latest in reaching maturity.

8. In the test at the Experimental Station, the fertilizers showed an average increase over no fertilizers of 11.5 per cent. of grain, and 21.1 per cent. of straw.

9. The average yield per acre from the co-operative tests was 45.5 bushel of oats and 1.28 tons of straw, and the yield per acre from the Station test was 67.1 bushels of oats and 2.22 tons of straw.

II—APPLICATION OF SODIUM NITRATE TO RAPE.

1. From a section of ordinary land, to which no manure has been applied for at least four years, measure out two uniform plots, each one rod wide by two rods long, and leave a path three feet wide between each two plots.

2. Prepare the soil for rape in much the same manner as you would that for a root crop.

3. In each plot make eight drills, two rods long, and leave twenty-five inches between every two consecutive rows.

4. During the last week in June sow the two packages of rape seed upon their respective plots.

5. When the young plants are about two inches high sow the package of sodium nitrate upon plot No. 1., after which stir the soil in each plot.

6. Cultivate the land in the same manner as you would that having a root crop.

7. About the end of October cut the rape and immediately weigh the crop from each plot.

The experiment by Geo. Wright, Wellington Co., is the only one recorded. The soil was a clay loam, cropped in 1891 with fall wheat, followed by rape in the spring of 1892. Farm-yard manure was applied in 1890.

YIELD OF GREEN RAPE (DWARF ESSEX).

	Per plot.	Per acre.
Nitrate of soda	500 lb.	20 tons.
No ertilizer	450 "	18 "

Nitrate of soda was applied at the rate of 80 lb. per acre. The cost of this fertilizer per acre, not including freight charges or expense of applying, was $2.20. Both the rape seed and the fertilizer used were obtained in Ontario.

In most instances a wrong kind of rape seed was furnished by the seedsmen, which greatly interfered with the value of this experiment. The variety used produced seed the same summer as sown. The Dwarf Essex rape, which is the variety recommended for fodder purposes, should not produce seed until the second year.

CONCLUSIONS.

1. A handsome yield per acre of green fodder can be obtained from a good crop of the Dwarf Essex rape.

2. While the application of nitrate of soda produced an increase in yield of rape, this increase was made at a cost of $1.10 per ton for the fertilizer used.

3. A variety of rape which produces its seed the first season after sowing is not as valuable for fodder purposes as one which does not produce seed until the second summer.

III—TESTING THREE VARIETIES OF MILLET.

1. Measure off three uniform plots, each two rods long by one rod wide, leaving a path of two feet between each two consecutive plots.
2. Prepare the land similar to that for a corn crop.
3. Sow broadcast the three packages of millet seed upon their respective plots during the first week in June. Aim at seeding one inch deep.
4. Cut the crop as soon as all the heads are in appearance.
5. Weigh the produce from each plot immediately on cutting.

Individual results of three experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yield of green millet per plot.		
					Salzer's Dakota.	Golden Wonder.	Common
					lb.	lb.	lb.
John Baker	Huron	Black loam	New land	Never man'red	250	234	165
E. Morden	Welland	do	Cabbage	1891 f. y. m	248	148	170
Ed. Butterworth	Victoria	Clay loam	Potatoes	do	112	56	56

Average results of three experiments.

Varieties.	Average of 3 co-operative tests.		Experiment Station test.	
	Height.	Yield of green crop per acre.	Height.	Yield of green crop per acre.
	in.	tons.	in.	tons.
Salzer's Dakota	51.0	8.1	42	12.7
Golden Wonder	31.3	5.8	33	11.1
Common Millet	33.3	5.2	31	7.4

The millet seed was sown at the rate of 40 lb. per acre. The Salzer's Dakota variety was obtained from Wisconsin, the Golden Wonder from Nebraska, and the common millet from Ontario

Conclusions.

1. In all the reports of millet during 1892 the Salzer's Dakota variety was not surpassed in yield per acre of green fodder by any other millet in any of the tests made.

2. The Salzer's Dakota millet gave an increase yield of green fodder per acre of 55.8 per cent. over the common millet in the co-operative experiments, and an increase of 71.6 per cent. in the Station test.

3. The average height of Salzer's Dakota millet in the four experiments of table was 51 inches, of the Golden Wonder 31.7 inches, and that of the common millet 32.7 inches.

IV—THE GROWING OF LUCERNE.

1. Select a one-tenth acre plot, conveniently situated to the stables, and in such a position that it may remain unbroken for a number of years.

2. Cultivate the ground thoroughly, making a fine seed bed.

3. Sow the 1.8 lb. of lucerne in the same way you would seed with red clover.

4. If there is a heavy crop of lucerne in the autumn, cut high ; if the crop is light, leave uncut.

Individual results of twelve experiments.

Experimenter.	County.	Nature of surface soil.	Nature of sub-soil.	Character of drainage.	Remarks.
William Lyman ..	Lambton ...	Clay loam....	Clay	Tile drain	Lucerne 12 in. to 14 in. high, nearly blossomed, looks well, even on ground, and I am well satisfied with it.
A. Warnica.....	Simcoe	Clay loam ...	Clay	Middling.....	I have ¼ of an acre, and have cut it four times this season ; it makes excellent summer feed for stock.
Wm. Chantler....	Simcoe	Clay loam....	Clay	Natural	Requires cleaner ground than I had ; when 12 in. to 15 in. it was cut with weeds, and eaten by horses and cattle with avidity.
J. I. Graham.....	Grey	Clay loam....	Clay	Natural	I was surprised how quickly it commenced to grow after being cut.
Thos. Armstrong..	Muskoka...	Light gravel..	.....	.....	Grew 2 ft. 6 in. high, not cut.
Ed. Butterworth..	Victoria	Clay loam....	Gravelly.....	.....	I believe it will form a good substitute for red clover, and will yield more per acre.
A. Wiancko	Muskoka...	Loam	Clay	Good	My land does not seem to be fit for it.
Geo. E. Merkley..	Dundas	Sandy loam...	Clay loam..	Open ditch....	Has appearance of sweet clover.
E. G. McCallum..	Glengarry ..	Clay	Clay	Natural	Seeded with barley ; considerable lucerne was in blossom when barley was cut; looked very well.
Peter Werry.....	Durham....	Light loam...	Clay	Rolling land..	On June the 24th the plants were from 6 in. to 10 in. high.
John Stub.....	Lanark.....	Clay loam....	Clay	Tile.....	Grew with a heavy crop of wheat, but lucerne did not make heavy growth.
W. J. Fletcher ...	Oxford	Sandy.....	Sandy to gravelly.	Good natural..	Lucerne produces light crop first year ; my neighbor sowed lucerne 5 years ago, and gets immense crops.

Average results of twelve experiments.

Crop.	Number of days required to germinate.			Height of plant in autumn.		
	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.
				in.	in.	in.
Lucerne	4	23	9.2	·6	36	14.2

Lucerne seed was sown broadcast at the rate of 18 lb. per acre. In some instances a grain crop was grown with the lucerne, but in several cases no grain crop was used. The seed was bought from an Ontario seedsman.

Conclusions.

1. The remarks of the experimenters are quite encouraging regarding the growth of lucerne during the first summer after seeding.
2. Marked variations are noticeable in the behavior of lucerne upon the various farms in Ontario.
3. A large crop of lucerne cannot be expected during the first season after sowing.

V—TESTING SIX PROMISING VARIETIES OF CORN.

1. Measure off six plots, each one rod square.
2. Mark out each plot into five rows both ways, allowing in every case 3 feet 4 inches between each two consecutive rows.
3. Plant each variety of corn upon its respective plot. Drop six kernels at each of the places where the lines touch, and thus make twenty-five hills of each variety.
4. When the corn is about four inches high, thin out to four plants per hill.
5. Cultivate all the plots alike and take necessary notes during the summer for the report.
6. Cut each variety before frost, and at the time when its stage of growth corresponds to the roasting condition of field corn, or when the ears are in the glazed state.

Individual results of twenty experiments.

Experimenter.	County.	Date of seeding.	Nature of soil.	Cropping of 1891.	Weight of whole crop per plot.					
					Mammoth Southern Sweet.	Thoroughbred White Flint.	True Leaming.	Mammoth Cuban.	Wisconsin Earliest White Dent.	Compton's Early.
					lb.	lb.	lb.	lb.	lb.	lb.
Sleightholm Bros.	Peel	May 30	H'v'y cl'y lo'm	Meadow	162½	164½	122	97	137	110
Nelson Monteith	Perth	June 10	Clay loam	Winter wheat	259	225	150	225	200	125
J. W. Henry	Simcoe	May 18	Light loam	Oats	285	220	225	230	172	160
W. A. Scott	Parry Sound	" 30	Sandy loam	Potatoes	200	200	185	175	200	150
Alexander Ritchie	Frontenac	June 1	Clay	Oats	164	131	117	126	117	60
W. G. Robertson	Dundas	May 19	do	Pasture	330	306	265	222	256	156
Phineas Hutchins	Grenville	" 20	Sandy loam		317	327	298	289	217	229
R. W. Hermon	Prince Edw'rd	June 7	Clay loam	Beans	360	242	220	230	167	125
Thos. B. Scott	Middlesex	" 1	do	Oats	188	232	188	232	208	96
Edmund Barrick	Welland	May 18	Clay & humus	Potatoes	280	300	260	160	188	100
William Merkley	Dundas	" 14	Gravelly loam	do	142	175	248	120	217	152
Alex. Thom	do	" 16	Sandy loam	do	280	283	240	265	223	144
G. W. Douglas	Lambton	" 31	Clay loam	Millet	195	210	160	149	140	120
D. E. Bloomfield	Brant	" 28	Sandy loam	Meadow	193	234	187	138½	139	128
Geo. E. Merkley	Dundas	June 2	do	Fodder corn	250	258	222	220	182	171
H. S. McConnell	Elgin	May 31	do	Potatoes	288	255	300	268	240	260
Walter Hartman	Grey	" 30	Clay loam	Alsike clover	277	302½	262	250½	231	192½
Alfred Brown	Prince Edw'rd	" 28	Dark clay	Rape	302	193	293⅘	237⅘	256⅖	153⅕
Wm. Blake	Huron	" 28	H'v'y cl'y lo'm	Oats	163	127	192	172	260	155
John Andrews	do	" 31	Clay loam		197	209	185	210	176	166

Average results of twenty experiments.

Varieties.	Average of 20 co-operative tests.		Experiment Station tests.	
	Weight of green ears per acre.	Total weight per acre.	Weight of green ears per acre.	Total weight per acre.
	tons.	tons.	tons.	tons.
Mammoth Southern Sweet	4.2	19.3	2.4	22.6
Thoroughbred White Flint	5.6	18.6	2.6	19.8
True Leaming	6.1	17.3	3.9	19.8
Mammoth Cuban	5.5	16.1	4.3	19.1
Wisconsin Earliest White Dent	5.8	15.7	4.7	17.8
Compton's Early	4.5	11.8	3.3	13.1

The Mammoth Southern Sweet, Thoroughbred White Flint and Compton's Early varieties of corn were purchased in Ontario; the True Leaming in Pennsylvania, the Mammoth Cuban in Nebraska, and the Wisconsin Earliest White Dent in Wisconsin. These varieties were chosen from among 76 kinds grown at the Station.

Conclusions.

1. No one variety of fodder corn is equally suitable for all parts of Ontario.
2. In yield per acre of green fodder the varieties occupy the same relative position in the average results of both the co-operative tests and the Station tests.
3. The greatest average of green ears was produced by the True Leaming in the co-operative tests, and by the Mammoth Cuban in the Station tests.
4. The Compton's Early and the Wisconsin Earliest White Dent were the first to reach maturity.

VI—TESTING FIVE PROMISING VARIETIES OF TURNIPS.

1. Five plots, each containing 272¼ square feet, are required for the experiment with turnips, or mangels or carrots.
2. Every two consecutive drills for the roots should be twenty-five inches apart.
3. Make all plots alike and arrange each plot according to one of the following plans: (*a*) Eight drills, 16 feet 4 inches long; or (*b*) four drills, 32 feet 8 inches long; or (*c*) two drills, 65 feet 4 inches long.
4. Sow the different varieties upon their respective plots.
5. Thin young plants in the rows to the following distances apart: Mangels and turnips, ten inches; carrots, four inches.
6. Be careful of the plants when cultivating and hoeing the ground.

Individual results of 13 experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yield of turnips per plot.				
					Red Globe Norfolk.	Hartley's Bronze Top	Carter's Elephant.	Fetterearn Green Top.	Royal Norfolk.
				stable manure.	lb.	lb.	lb.	lb.	lb.
Alex. Morton	Huron	Clay loam	Oats	1892	572	436	500	480	324
W. Fotherington	Huron	Clay loam	Oats	1892	431	333	305	308	284
Allan Shantz	Waterloo	Garden loam	Winter wheat	1892	384	308	265	283	253
A. Wiancko	Muskoka	Clay	Roots	1892	245	420	415	386	409
W. J. McKnaughton	Glengarry	Black loam	Potatoes	1892	380	275	367	346	260
W. H. Caton	Welland	Clay loam	Potatoes	1892	215	62	84	75	105
W. J. Quinn	Muskoka	Loam	Potatoes	1892	143	169	93	167	172
W. H. Phillips	Hastings	Clay loam	Clover	1892	140	160	165	175	172
Benjamin Story	Prince Edward.	Sandy loam.	Turnips	1889-90	221	351	299	182	237
Enos Remner	Ontario	Clay soil	Clover	1891	361	320	310	300	280
Thos. Fagan	Simcoe	Good loam	Oats	1892	736	416	336	408	368
John Rumford	Huron	Clay loam	Native grass		285	290	300	250	350
E. Morden	Welland	Soft sandy	Corn	1892	300	280	286	242	200

Average results of 13 experiments.

Varieties.	Average of 13 co-operative tests. Yield per acre.	Experiment Station test. Yield per acre.
	bush.	bush.
Red Globe Norfolk	905.2	774.7
Hartley's Bronze Top	783.6	698.3
Carter's Elephant	764.1	578.7
Fettercairn Green Top	738.9	578.7
Royal Norfolk Purple Top	699.7	600.7

The Red Globe Norfolk is a white-fleshed fall variety, and the other four are Swede turnips. Seed of each of these kinds was obtained from Ontario, with the exception of that of the Carter's Elephant, which was imported from England.

Conclusions.

1. The fall turnips gave a greater yield per acre than any of the Swede varieties, in the average results of the co-operative experiments and in the test at the Experiment Station.

2. The Carter's Elephant Purple Top Swede, which gave the highest average yield over Ontario in 1891, stands third in point of yield for 1892.

3. The average yield, from five varieties of turnips, grown in thirteen different parts of Ontario, was 738 bushels per acre.

VII—TESTING FIVE PROMISING VARIETIES OF MANGELS.

Instructions.—Same as those given for turnips.

Individual results of 10 experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yield of mangels per plot.				
					Our Selected Mammoth Long Red.	Carter's Champion Yellow Intermediate.	White Sugar Beet.	Carter's Warden Orange Globe.	Red Globe.
					lb.	lb.	lb.	lb.	lb.
E. Worthington	Leeds	Gravelly l'm	Roots	1881 f. y. m.	625	612	442	445	451
A. Wiancko	Muskoka	Clay	Roots	1892	480	415	405	355	476
G. S. Hull	Middlesex	Clay loam.	Potatoes	f. y. m.	1095	907	539	391	378
John Rendall	Grey	Sandy loam.	Potatoes	1892 f. y. m.	318	489	350	358	279
James Cruickshank	Kent	Sandy	Potatoes	1892 f. y. m.	388	327	249	209	206
W. A. Graham	Lambton	Clay loam.	Peas and oats.	1891 f. y. m.	572	156	364	260	182
R. H. Smithrim	Middlesex	Clay loam.	Mangels	1892 f. y. m.	232	225	152	167	223
W. Fotherington	Huron	Clay loam.	Oats	1892	222	200	166	246	172
Geo. H. Ferguson	Grey	Clay loam.	Potatoes	1892	285	270	275	245	260
Simpson Rennie	York	Clay loam.	Peas, barley and oats	1892 night soil	487	478	432	370	372

Average results of 10 experiments.

Varieties.	Average of 10 co-operative tests. Yield per acre.	Experiment Station test. Yield per acre.
	bush.	bush.
Our Selected Mammoth Long Red.....	1069.6	906.
Carter's Champion Yellow Intermediate	939.9	998.0
Vilmorin's Improved White Sugar Beet	828.9	542.7
Carter's Warden Orange Globe.....	786.3	697.0
Red Globe.....	776.6	541.0

The seed for this experiment was all purchased in Ontario. The variety of Sugar Beet is one used for the purpose of stock feeding.

Conclusions.

1. The Steele Bros.' Mammoth Long Red mangel gave the highest yield of roots per plot in eight of the co-operative experiments, out of the ten conducted in Ontario.

2. The Sugar Beet occupied an intermediate position between the Long varieties and the Globe varieties of mangels.

3. The Sugar Beet gave an excellent average yield over Ontario during 1892.

VIII—TESTING FIVE PROMISING VARIETIES OF CARROTS.

Instructions—Same as those given for Turnips.

Individual results of 15 Experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yield of carrots per plot.				
					Improved Short White.	Large White Vosges.	Large Belgian.	Carter's Orange.	Mitchell's Perfected.
					lb.	lb.	lb.	lb.	lb.
Simpson Rennie.....	York	Clay loam....	Barley	1891, night soil	509	460	397	345	326
G. S. Hull	Middlesex..	"	Wheat	1892, f. y. m..	434	434	411	359	369
R. H. Smithrim.....	" ..	"	Mangels ...	1892, " ..	239	174	179	175	189
Robert Currie	Lambton ..	"	Potatoes ...	1891-2, " ..	350	215	280	330	355
John D. Scott.....	Durham..	Sandy loam ..	Garden.....	1892, " ..	177	199	186	173	177
Wm. E. Armstrong	Muskoka ..	Heavy loam ..	Turnips	1891, " .	128	182	120	390	112
John Dalton.....	Simcoe.....	Rich clay loam	Onions	1891, " ..	372	343	314	202	267
Robert King	Kent	Sandy soil....	Roots	Salt.....	214	210	216	217	214
Thomas Watson	Haldimand .	Sandy loam ..	Raspberries.	None.....	271	192	256	203	200
Geo. E. Merkley	Dundas	" .	Fodder corn	1892, f. y. m..	248	284	228	204	208
John Randall	Grey	" ..	Potatoes ...	1892, " ..	285	308	221	142	227
A. Wiancko.....	Muskoka ..	Hard clay....	Roots	1892, " ..	155	105	121	97	110
Wm. McGarry	Lanark	Gravelly loam	Peas	1891, " ..	270	540	290	270	240
R. J. Moon.....	Simcoe.....	Sandy loam .	Potatoes ...	1891.....	437	351	365	338	248
T. H. Carroll.....	Wellington .	.....	.....	.....	194	115	131	95	120

Abbreviation—f. y. m., farm yard manure.

Average results of 15 Experiments.

Varieties.	Average of 15 co-operative tests—yield per acre.	Experiment Station test—yield per acre.
	(bush.)	(bush.)
Improved Short White	761.4	1265.0
Large White Vosges	731.0	1130.0
Large Belgian	660.4	1073.3
Carter's Orange	629.2	840.0
Mitchell's Perfected	597.9	840.0

The seed of all the varieties of carrots was obtained in Canada.

CONCLUSIONS.

1. The Improved Short White carrot took the lead in point of yield in 50 per cent. of the co-operative experiments during 1892.

2. The average weight per root of the Improved Short White in the co-operative tests was .93 lb., and in the Station test it was .98 lb.

3. The two varieties of carrots which were the easiest to remove from the ground at the time of harvesting were the Improved Short White and the Large White Vosges.

4. The white varieties of carrots all gave larger yields than the yellow-fleshed kinds.

5. The comparative yields of the different varieties were substantially the same in both the co-operative and the Station tests.

IX—TESTING SIX PROMISING VARIETIES OF SPRING WHEAT.

(1) Select a portion of uniform soil and mark off six plots, each one rod square. Allow a path two feet wide between each two consecutive plots.

(2) Drive stakes at the four corners of each plot.

(3) Sow the different varieties upon their respective plots. It is an advantage to run a strong cord around each plot and sow inside the line.

(4) After the grain is up three or four inches, again run the cord around the plots and cut off any plants that happen to be outside the line.

Average results of 35 experiments.

Varieties.	Average of 35 co-operative tests.		Experiment Station test.	
	Straw per acre.	Grain per acre.	Straw per acre.	Grain per acre.
	Tons.	Bushels.	Tons.	Bushels.
Red Fern	1.8	19.6	2.2	27.8
Manitoulin	1.6	19.0	1.3	26.8
Herison Bearded	1.7	18.3	2.0	24 0
Pringle's Champion	1.7	18.3	2.1	23 7
Rio Grande	1.7	18.2	1.8	20.5
Holben's Improved	1.6	17.8	2.0	22.6

The seed of the Herison Bearded variety was originally imported by the Ontario Experiment Station from France in 1888, that of the Pringle's Champion and Holben'

Improved from Germany in the same year, and that of the Red Fern, Manitoulin and Rio Grande was obtained in Ontario.

Individual results of 35 experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yield of spring wheat per plot (lb.)					
					Red Fern.	Manitoulin.	Herison Bearded.	Pringle's Champion.	Rio Grande.	Holben's Improved.
George Bennett..	Simcoe.....	Sandy loam.....	Potatoes.....	1892, .ashes.	8	7	6	6	5	6
Thos. B. Moon..	Simcoe.....	Clay loam.....	Pasture	.....	8	6	5½	5¼	7	7
M. G. Easton....	Renfrew....	Sandy loam.....	Potatoes.....	New land...	9	9	8½	8½	8½	8
Thomas Fagan...	Simcoe.....	Good loam.....	Hay.....	'87, f. y. m..	5½	5	4¾	4	6	6
W. Hartman....	Grey.	Clay loam.....	Peas.....	No manure.	5⅜	5⅜	6¼	4½	6	5⅜
Jas. W. Young..	Wentworth.	Black loam.....	Beans.....	.....	5	3	2½	3	3	2½
Wesley Stevens .	York.	Heavy clay.....	Barley.....	'90, f. y. m..	7	5	6⅜	6¾	7¼	7
J. J. Campbell..	Glengarry .	Clay and gravel.	Corn.....	'91, f. y. m..	9	14	8	7	4	6
G. E. Petepiece..	Carleton....	Heavy clay marl	Potatoes.....	'91, f. y. m..	6½	9	3	6	4½	6½
D.McNaughton..	Bruce	Clay loam.....	Winter wheat	'87, B're f'low	6¼	6¼	8	6½	7½	7
James Holmes...	Grey.....	Clay loam.....	Roots	'91, f. y. m..	9	7	7	8	7½	7
David Rogers....	Frontenac..	Light clay loam.	Potatoes,.....	'91, f. y. m..	12	8	14	10	10	12
Thos. Graham...	Ontario....	Clay loam.....	Potatoes.....	'91	10	8	11	11	12	9
E.G. McCallum..	Glengarry.	Clay.....	Corn fodder..	'82, f. y. m..	10	8	9	9½	9¼	8⅜
James Collison...	Dundas.....	Gravelly loam.	Wheat	'91, f. y. m..	40	37	40	39	45	35
L. V. Burnham..	Lambton....	Sandy loam.....	Corn.....	'92, f. y. m..	10½	11	13½	14	11	10
W. A. Jemison..	Simcoe.. ...	Clay loam.....	Winter wheat	'85.....	5½	7¼	5½	5	4	5½
P. S. McGarry ..	Lanark.....	Clay loam.....	Oats.....	Never mn'd	3¾	3¾	2½	3¼	3	3½
J. A. Swan.....	.....	.....	.....	.....	4	4⅜	2½	3⅛	3⅛	3⅛
Samuel Brown...	Parry Sound	Sandy loam.....	Oats.....	Never.....	1½	3½	3	2½	3	4
Jos. Martineau ..	Prescott....	Clay loam	Barley.....	'90, f. y. m..	4	4½	4⅞	4⅝	4	4½
O. A. Lawrence..	Halton.....	Heavy clay.....	Peas.....	.....	2⅞	3⅝	3¾	2½	3½	3¼
Jos. M. Rogers..	Grey.....	Clay loam.....	Roots.....	'92, t. y. m..	2½	6⅛	7⅛	4½	6⅜	6¼
James Capstick..	Victoria	Clay loam.....	Turnips	'82, f. y. m..	5	4⅛	1½	3½	4	3⅛
D.P. L. Campbell	Glengarry..	Loam	Corn.....	'91...	4⅜	5¼	9	8	4½	8
Wm.McDonald..	Algoma	Clay loam.....	Oats	'91, f. y. m..	4	3½	2½	3	3½	3¼
Jno. Henderson..	Hastings....	Clay loam.....	Oats.....	Past're 20yrs	5	8	6	5	5½	5¼
W. McKenzie....	Perth	Clay loam.....	Mangels	'91.....	4	3	6	3	5	3
Jno. McAsh.....	Huron.....	Limestone clay.	Potatoes.....	'91	4¾	4¾	3¼	3¼	3	4¾
W. T. Gale.....	Nipissing...	Black clay.....	Peas.....	.....	6	6	3½	10	5	2¼
A. A. Moody....	Wellington..	Clay loam.....	Carrots.....	.....	6	5	3½	3	2	4
James Wilkinson	Dufferin....	Clay loam.....	Wheat'.....	'90, f. y. m..	8	6	6	6	7	6
Angus Ross.....	Ontario.....	Heavy clay.....	Roots.....	f. y. m..	6½	5½	5½	6	4½	4⅓
James Johnston.	Muskoka....	Clay loam.....	Peas.....	'90, f. y. m..	10	9⅓	6	7½	7	8⅓
James Johnston.	Dufferin....	Clay loam.....	Wheat	'91, f. y. m..	8	7	6	6	8	6

Conclusions.

1 The variety of spring wheat which came first in point of yield of grain in the greatest number of experiments was the Red Fern, and the variety which came second was the Herison Bearded.

2 The Red Fern gave the largest average yield of both grain and straw in the co-operative experiments and also in the Station test.

3 The first varieties to reach maturity were the Herison Bearded and the Pringle's Champion, and the last to reach maturity were the Holben's Improved and Rio Grande.

4 The longest straw was produced by the Rio Grande, and the shortest by the Herison Bearded.

5 The strongest straw was produced by the Manitoulin and the Holben's Improved, and the weakest straw by the Herison Bearded and Rio Grande.

6 With but one exception the comparative yields of grain of the different varieties were the same in both the co-operative tests and the Station experiment.

X—TESTING SIX PROMISING VARIETIES OF BARLEY.

Instructions.—Same as those given for Spring Wheat.

Individual results of 5 experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yield of barley per plot (lb)					
					Mandscheuri.	Oderbrucker.	Common Six-rowed.	Hallett's Pedigree.	Improved Cheyne.	French Chevalier.
Hugh Caldwell..	Peterboro'..	Light loam.....	Buckwheat...	'91, f. y. m.	11	10	8	8	7	7
W. H. Metcalf..	Brant	Sandy soil.	Potatoes.....	'91.....	15	10	10	12	12	11½
E. G. McCallum.	Glengarry ..	Clay	Corn	.....	13	14⅜	12	9¾	9¾	10⅝
Robert Banden..	Elgin.....	Black loam.....	Potatoes.....	Never.....	12	5	6	4	4	2
Wm. Wilkinson.	Dufferin....	Clay loam.....	Wheat	'89, f. y. m.	10	9	10	8	8	8

Average results of 5 experiments.

Varieties.	Average of 5 co-operative tests.		Experiment Station test.	
	Straw per acre.	Grain per acre.	Straw per acre.	Grain per acre.
	Tons.	Bushels.	Tons.	Bushels.
Mandscheuri.....	1.7	40.7	1.6	53.3
Oderbrucker..... .	1.2	32.5	1.3	42.2
Common Six-rowed...	1.3	30.7	1.2	42.8
Hallett's Pedigree.....	1.2	27.8	1.6	39.8
Improved Cheyne.....	1.3	27.2	2.1	50.3
French Chevalier.....	1.3	26.2	2.0	51.7

With the exception of the Common Ontario Six-rowed, these varieties were all imported by the Ontario Experiment Station in the spring of 1889. The Mandscheuri came from Russia ; the Oderbrucker and Hallett's Pedigree from Germany ; the Improved Cheyne from England, and the Chevalier from France.

Conclusions.

1 The Mandscheuri variety of barley gave an average yield of 10 bushels per acre more than the Common Ontario Six-rowed in the co-operative tests, and 11.5 bushels per acre more in the experiment at the Station.

2 The Mandscheuri variety of barley gave the greatest yield per plot in nearly every instance.

3 The three six-rowed varieties gave greater yields of grain per acre than the three two-rowed varieties in the co-operative tests.

4 The six-rowed varieties of barley all reached maturity at an earlier date than the two-rowed varieties.

5 The longest straw was produced by the Mandscheuri, and the shortest straw by the Chevalier.

6 The strongest straw was produced by the Mandscheuri, and the weakest by the Oderbrucker.

XI.—TESTING SIX PROMISING VARIETIES OF OATS.

Instructions same as those given for Spring Wheat.

Individual results of one hundred and twenty-five experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yields of oats per plot (lb.)					
					Siberian.	Bavarian.	Joanette	Oderbrucker.	Poland White.	White Tartarian.
W. G. Wilson	Grey.	Gravel loam	Peas	Never	14	14½	12¾	13½	12¾	13½
Thos. Teasdale	Norfolk	Sandy loam.	Sod	'91, h. m.	16	15½	14	14½	15	13
Rymal Young	Wentworth	Black loam.	Beans		10	12	10	10	12	9½
Wilby Scott	Simcoe.	Clay	Wntr. wheat	s. m.	11	10	9	9	10	9
G. M. Freeman	York.	Clay loam.	Beans	'91, s. m.	15 1/16	16	11 1/16	14	13 1/16	12½
Valentine Foerster	Huron	Clay loam.	Corn	'89, s. m.	12¾	14	13¾	12½	13¼	13
E. G. McCallum	Glengarry	Clay	Corn.		14¾	15½	12	15¼	12¾	13¾
R. H. Smithrim	Middlesex	Clay loam.	Wntr. wheat	'92, s. m.	11½	11	8	14	12½	10½
Edgar M. Husband	Middlesex				5¼	4	3	5	5¼	6
John Anderson	Huron	Clay loam.	Oats	'91, s. m.	11	9½	14	9	7	10
J. H. Esplen	Bruce	Clay loam.	Corn.	'91, s. m.	14	14	13	14	13	12
Thos. E. Hays	Huron	Clay loam.	Peas		13	14½	15	15½	14	13½
David Gilmour	Grey.	Clay loam.	Potatoes.		12	6 6/8	12½	6	8	10 1/6
Joseph G. Decker	Elgin	Clay loam.	Turnips	'90, s. m.	13¼	12	14½	12	14½	9
John Jackson	Lincoln	Clay loam.	Mangels	'90, s. m.	9½	9½	8	9½	8½	11
Erland Lee	Wentworth	Clay loam.	Oats		8	11	7	9½	9¾	11½
David Crich	Monck	Sandy loam.	Pasture		5¼	4¼	10	8	8¼	6¼
Thos. Yegge	York.	Clay loam.	Turnips	'91, s. m.	15	16	13	15	15	15
David Madden	Bruce	Clay loam.	Peas	'84, s. m.	18½	14½	21½	16½	21	17
G. S. Hull	Middlesex	Sandy loam.	Wheat.		25	24	27	28½	22	24
James Henderson	Hastings	Clay loam.	Potatoes	'91, s. m.	15½	16	17	16	17	18
Philip Corbett	Grey.	Sandy loam.	Potatoes	'91, s. m.	15	17	12	11	11	16½
Henry Warren	Middlesex	Clay loam.	Hay	Never	11½	10	10	11	11	9½
George Millar	Haldimand.	Black loam.	Potatoes	'92, s. m.	11½	11¾	11	11½	11½	10½
John Henry	Algoma	Red clay	Peas	Never	14	13	11	18	8	12
D. Larmour	Dundas	Black loam.	Oats.	'90, s. m.	10	10	11	9	9	8
J. H. Garbutt	Peterboro'	Clay loam.	Oats.	'91, s. m.	9	9	10	12½	9	7½
Samuel Murphy	Elgin	Sandy loam.	Rye	'90, s. m.	8½	12½	11	10½	8¾	11
J. K. Campbell	Grey.	Sandy loam.	Peas	'92, s. m.	4	4	4½	3½	6½	4½
Patrick McAlpin	Hastings.	Clay loam.	Oats	Pasture	5	3 1/16	3⅝	3 1/16	3 1/16	3½
J. H. Montgomery	Essex	Heavy clay.	Potatoes	None	1¼	2⅜	2⅞	2½	1½	2 3/16
C. R. Stevenson	Elgin	Clay loam.	Pasture	Never	3¾	4¾	3½	4⅛	4	3½
Wm. Thurston	Victoria	Sandy	Buckwheat.	Never	6⅝	6 7/16	8 11/16	5 7/16	6¼	7⅜
Robert Gardiner, Jr	Huron	Clay loam.	Hay		9½	10	8	9	9	10
Thos. N. Hipwell	Simcoe.	Clay loam.	Wntr. wheat	'92	12	15	14	10	13	13
Chas. Silverthorn	York	Clay loam.	Hay.	'92, s. m.	15	14½	13	12	13	12½
John McBride	Dufferin	Sandy loam.	Spring wh't	'87, s. m.	20	20	18	19	17	21
Angus L. Brie	Simcoe	Clay loam.	Bare fallow.	'91	19	7½	13	10	12	15
J. H. McCorkindale	Grey	Sandy loam.	Barley.	'90	16	12	13½	14	11½	9½
Neil S. Murray	Oxford.	Clay loam.	Turnips	'91	11	15	8½	11	16	13
Wm. Ferguson	St. Joseph I'd.	Light	Sod	None	9	10	7	11	10	12
Alex. S. McDiarmid	Elgin	Clay loam.	Wheat	'90, s. m.	9	10½	10½	8½	10½	8
Wm. Frishette	Norfolk	Clay loam.	Wheat	'91, s. m.	7	8	9¾	7½	8	5¼
James Tesky	Addington	Aluv. clay.	Oats, 12 yrs.	Never	3½	3½	½	3¾	6	3
T. C. Stark		Clay	Spring wh't	3 yrs. s. f.	7½	5	10	3¼	5	6
F. W. Lowin	Nipissing	Light gravel	Potatoes.	Never	7	9	7	5	6	7
Alex. McInnis	Essex	Sandy loam.	Corn	'88, s. m.	6	5	7¼	7	7	5½
A. D. Gillis	Kent	Loam	Oats.	'89.	7½	9	5½	8	8	9
W. A. Johnston	Dufferin	Clay loam.	Potatoes	'91.	12	10	13	11	12	11
Jas. W. Fisher	Norfolk	Sandy loam.	Garden	'92, hen m	14	19	14½	10⅓	13	14
John Dalgarno	Grey.	Clay loam.	Oats	Never	19	17	16	17	16	20
Malco'm Cameron	Grey.	Clay loam.	Potatoes	'91, s. m.	26	13½	19	10	15	14½
James Smith	Grey.	Gravel loam	Turnips	'91, s. m.	20	23	17	15	24	20
Martin Emigh	Oxford	Clay loam.	Corn	'91, s. m.	20	18½	25	16	17½	12
J. N. Kerrighan	Huron	Sandy loam.	Pasture	Never	12½	10	13½	14½	14	19½
Robert Russel	Bruce	Clay loam	Fallow	Never	10	9½	4½	4	13½	11⅓
Michael McQuade	Huron	Clay	Oats	Never	12	12	13	12	12	14
Alex. Mitchel	Wentworth	Clay	Potatoes	'91.	14	19	13	11	14	14
Gordon Young	Huron		Clover	'92, s. m.	11	13	12	13	10	10
James Alexander	Halton.	Black loam.	Wheat	Never	10	9½	7½	7	6	8
Donald Fleming	Grey.	Sandy loam.	Potatoes	'91, s. m.	15½	14½	9½	12½	10¾	11¼

Contraction: s. m.—stable manure.

Individual results of one hundred and twenty-five experiments.—*Continued.*

Experimenters.	County.	Nature of soil.	Cropping of 1891.	How and when last manured.	Yield of oats per plot. (lb.)					
					Siberian.	Bavarian.	Joannette	Oderbrucker.	Poland White.	White Tartarian.
V. Emanuel	Middlesex	Gravel loam	Oats	'89, s. m.	15	13½	13	15⅓	12	13
N. C. Brown	Elgin	Sandy loam.	Corn	'91, s. m.	13	11	12	12½	10	11½
Alfred Smith	Brant	Sandy loam.	Mangels	Ashes	13	14	13½	14	14½	16
A. T. Brown	Huron	Rich c. loam	Wntr. wheat		13½	12¼	12⅝	12½	12¾	8½
John Hall	Grey	Black loam.	Peas	Never	16½	16	15⅝	14½	16½	15½
David Noble	Bruce	Clay loam.	Turnips	'91, s. m.	16½	14	13	15½	13	15
Dawson Kennedy	Peterboro'	Clay loam.	Wheat		15	15½	14¾	16	17	10½
D. Hurley	Peterboro'	Loam	Barley	'90	12	13	9	5	5½	6
John Hunter	Lambton	Clay	Wntr. wheat		14	13	13	14	15	12½
T. C. Stark	Frontenac	Black muck.	Mangels	'90, s. m.	7	10	14	13	11	9
Francis McDonald	Bruce	Clay loam.	Peas	'86	12½	11	13½	11½	13	14
Wm. J. Roger	Perth	Clay loam.	Potatoes	'91, h. m.	13	12	11	11½	12½	11
John D. McKay	Kent	Clay loam.	Oats	Never	11	11	9	10	10	11
John Watson	Ontario	Loam	Wheat	'88, f.y.m.	12	11½	13½	10½	12	10
Wesley Buskin	Grey	Light clay.	Wheat	'88, f.y.m.	11	12	11	8	11	10
James Young	Algoma	Clay loam.	One crop	'91, f.y.m.	9½	9	6	8	8½	6½
Alex. S. Weir	Muskoka	Light loam.	Mangels	'92, f.y.m.	8	5	9	9	6	9
J. G. McKay	Bruce	Clay loam.	Spring wh't	'89, f.y.m.	8¾	10¼	10	8½	8½	7¼
Alfred Ray	Muskoka	Light c.loam	Oats	'90, f.y.m.	7	6½	5½	11	6½	11
Chas. Bard	Muskoka	Clay loam.	Flax	'89	7⅛	7⅞	6½	7 1/32	5 3/32	6 1/16
Nicholas DeHart	Simcoe	Light clay.	Potatoes	'91	6¼	8 3/16	6½	8⅝	7½	6⅜
David Kiernan	Dufferin	Clay loam.	Barley	'90	10	7½	9	12½	12	11
John Harcourt	Lincoln	Black loam.	Pasture, 8 y's		10	10 3/16	10 1/16	5 1/16	9	8½
Wm. Howe	Bruce	Clay loam.	Barley	'84, f.y.m.	8 7/16	9 1/16	7½	7⅝	8⅜	7¼
Amos Picard	Perth	Clay loam.	Hay	'88, f.y.m.	7	8	7½	9½	7	8
James Bell	Lanark	Clay	Oats	Never	7	5½	5½	7½	6½	8
M. Munroe	Glengarry	B. loam	Oats		9	8	7	8	9	10
Bernard Kelly	Simcoe	Clay	Peas	'90	15½	17	16	16¼	18	17½
Conrad R. Gies	Waterloo	Clay loam.	Wntr. wheat	'90, f.y.m.	16	12⅝	17	16¾	14⅛	13¾
John Brydone	Perth	Clay loam.	Roots	'91, f.y.m.	17	25	18	22	18½	16½
John H. Westwick	Parry Sound	Sandy loam.	Carrots	'92, Guano	19	10	9¾	14	16	12½
John Richardson	Dufferin				17	15	17½	16	16½	14
Duncan Graham	Perth	Clay loam.	Peas	'88	25½	20½	20½	28½	27	23½
R. E. Main	Grey	Clay loam.	Wheat	New land	29	23½	19½	22	17	22
Thos. Graham	Ontario	Clay loam.	Potatoes	'91	32	23½	19	29	25	39
Richard Stutt		Clay loam.	Turnips	None	37	36	37	35	40	33
James H. Newlove	Peel	Clay loam.	Wntr. wheat	'90, f.y.m.	19¾	23	21½	22⅓	19¼	21
J. W. Springsted	Wentworth	Heavy clay.	Oats	'85, fallow	12	10	10½	10½	7½	8½
Samuel Brown	Parry Sound	Sandy loam.	Oats	None	7½	6	5	5	7	7
Arthur Ribble	Elgin	Clay	Potatoes	'92, f.y.m.	5	6	5	6	4¾	5½
Benj. Mannen	Brant	Clay	Meadow	'88, f.y.m.	8	5	10	11	6	5
Edward Butterworth	Victoria	Clay loam.	Potatoes	f.y.m	7	5	7	8	6	8
Edward Prout, Jr	Durham	Sandy loam.	Turnips	'91, f.y.m.	3	3¾	5	3½	8	3½
B. W. Harrington	Hastings	Gravel loam	Weeds	New land	2 5/16	4¼	3½	6¼	2½	4¼
Elmer Lick	Oshawa	Clay loam	Hay		8¾	9	9¾	10½	8	8¾
Thos. Fagan	Simcoe	Light loam.	Wheat	'86, f.y.m.	12½	12	9¾	14	10	10½
Wm. Rowand	Bruce	Clay loam.	Spring wh't	'91, f.y.m.	12 7/16	12½	10 5/16	8¾	12¼	16¼
Jas. Murison	Elgin	Blk. s. loam	Potatoes	'91, f.y.m.	15½	15½	12½	11½	12½	10
Jno. McKowen	Parry Sound	Clay loam.	Oats	'92	10	14	12	9	10½	8
Alf. Brown	PrinceEdward	Sandy loam.	Sweet Peas	'90, f.y.m.	15¾	23¼	8 7/8	9 7/16	9	13½
Alex. Morton	Huron	Sandy loam.	Roots	'91, f.y.m.	12	13	13	15	13	13
Robert Bandeen	Elgin	Black loam.	Mangels	Never	11	11	11	8	12	9
Michael King	Dundas	Light c.loam	Oats	'92, f.y.m	9	9	11½	9½	8	8½
Robt. Currie	Lambton	Clay loam.	Barley	'90, f.y.m.	11	12	12	8	12½	10
Joseph Smith	Simcoe	Clay		'90, fallow	9½	10	9¾	7	9¾	10½
James Haylon	Oxford	Rich clay	Oats	'91, f.y.m.	9	6	8½	6½	4	5
W. J. Sproul	Dufferin	Clay	Pasture	'88, f.y.m	11	10½	15½	14	9	12
Richard Delbridge	Huron	Clay	Turnips	'91, f.y.m.	12	10	15	13½	12	15½
Hugh Davidson	Algoma	Sandy loam.	New land	None	16½	18	10	10	10	10
Chas. A. Young	Algoma	Clay loam.	Oats	Never	14	18	9	10¼	16⅜	16¼
Edward W. Young	Bruce	Clay loam.	Peas	'91, f.y.m.	17	16	16	13½	11½	14½
Robert Anglin	Frontenac	Clay loam.	Peas	Sod	9½	11	8½	8½	8	11½
H. Brown	Huron	Clay loam.	Roots	'91, f.y.m.	17	15	19½	16	13	12
Geo. W. Maxwell	Peel	Sandy loam.	Peas	'88, f.y.m.	38	34	41	35	30	25

Average results of 125 experiments.

Varieties.	Average of 125 co-operative tests.		Experiment Station test.	
	Straw per acre.	Grain per acre.	Straw per acre.	Grain per acre.
	tons.	bush.	tons.	bush.
Siberian	1.7	58.84	2.6	75.6
Bavarian	1.9	57.34	2.9	70.8
Joanette	1.7	55.31	2.8	76.5
Oderbrucker	1.8	54.76	2.8	82.4
Poland White	1.9	54.50	2.4	68.8
White Tartarian	2.0	54.21	2.6	61.0

The Siberian and the White Tartarian were imported from Russia, the Bavarian and Oderbrucker from Germany, and the Joannette and Poland White from France. With the exception of the Bavarian, the varieties were all imported by the Ontario Experiment Station in the spring of 1889. The Bavarian was brought into New York State some years ago, and from there into Western Ontario.

Conclusions.

1. In the average of 125 experiments there was only a difference of 4.63 bush. of grain per acre between the lowest and the highest yielders.

2. The Joanette, which comes third in the co-operative experiments, stands second in the Station test for 1892.

3. The longest straw was produced by the White Tartarian, and the shortest straw by the Joanette and the Oderbrucker.

XII—TESTING PROMISING VARIETIES OF WINTER WHEAT.

1. Select a portion of uniform soil and mark off five plots, each one rod square. Allow a path three feet wide between each two consecutive plots.
2. Drive stakes at the four corners of each plot.
3. Sow the different varieties upon their respective plots. It is an advantage to run a strong cord around each plot and sow inside the line.
4. After the grain is up three or four inches, again run the cord around each plot and cut off any plants that happen to be outside the line.

Average results of 39 Experiments.

Varieties.	Number of experiments.	Average of 59 co-operative tests. Grain per acre.	Experiment Station test. Grain per acre.
		bush.	bush.
Canadian Velvet Chaff	26	26.2	45.3
American Bronze		28.5	52.5
Canadian Velvet Chaff	33	27.0	45.3
Jones' Winter Fyfe		30.9	47.1

Thirty-seven varieties of winter wheat were sent out in the autumn of 1891. These were divided into ten different sets. The Canadian Velvet Chaff was included in all these, the American Bronze in one half, and the Jones' Winter Fyfe in the other half of the sets. The three varieties which were used extensively in the tests show results which are interesting and valuable.

Individual results of 39 Experiments.

Experimenter.	County.	Nature of soil.	Cropping of 1891	Yield of winter wheat per plot, (lb).	
				American Bronze.	Canadian Velvet Chaff.
Joseph Bell	Simcoe	Clay loam		12	11½
Robert Warwick	Huron	"	Peas	14	10
Jno. F. Brown	York	"	Alsike clover	10	8
Richard Warren	Lanark	"	Peas	7	7½
Thomas Ruddell	Wellington	"	"	9	8½
R. V. Phillips	York	"	Potatoes	9 5/16	7 3/4
John Milroy	York	"	Peas	11	9
Charles Krooter	Huron	"	Barley	14	13
H. A. Walker	Durham	Clay	Bare fallow	18	22
Wm. Inkster	Bruce	Strong clay	Peas	19	22½
E. G. Hacker	Elgin	Clay loam	Oats	11 5/8	7½
Wm. McDonald	Simcoe	"	Pasture	11	12
Thomas Chalmers	Wellington	Light loam	Bare fallow	9½	11
Frank Shuh	Waterloo	Sandy loam		7 7/8	6
Thomas Smith	Simcoe	"	Hay	4	3½
Wm. Purdon, jr	Lanark	Clay	Never cropped	7	3
W. F. Davidson	Peel	"	Barley	7½	3½
Wm. McGregor	Halton	Sandy soil	Oats	8	8
Elisha Barber	Norfolk	Clay loam	Potatoes	9 3/32	4 7/8
B. Henderson	Bruce	Clay	Oats	8	7
George Baird, sr	Huron	Clay loam	Bare fallow	8	8 1/8
Donald Jack	Perth	Clay	"	8	9
Jno. Atton	Bruce	Clay loam	Pasture	7	9
W. O. Jones	Huron	Clay	Oats	8	9
Jno. Phillips	Huron	Sandy clay	Bare fallow	18	16
T. A. Walker	Wentworth	Sandy soil	"	22	18
				Jones' Winter Fyfe.	
Ernest Morgan	Middlesex	Clay loam	Oats	15	13
Robert Cussins	Ontario	Clay	Barley	16	14
Mark Crawforth	Ontario	Strong clay	"	15	13
Thomas Dryden	Bruce	Clay loam	Pasture	12	11
Jacob Travis	York	"	Peas	12 1/3	11 3/8
Wm. Cumberland	Simcoe	"	Bare fallow	12	10½
Albert W. Bishop	Oxford	"	Corn	9 5/16	10 5/16
Robert Wilson	Bruce	Sandy soil	Oats	6¼	4 3/8
W. H. Caton	Welland	Clay loam	Bare fallow	3¾	4 7/16
Jas. Stitt	Norfolk	Sandy loam	Potatoes	6 5/8	6½
John Riddle	Northum'land	Clay	Meadow	5½	7
G. S. McTaggart	Hastings	Sandy loam	Hay	8	6
John Bent			Peas	11	8
Joseph Tuck	Welllington	Loam	"	11	10
Wm. Beatson	York	Clay loam	Oats	8½	8½
Aaron Keffer		Sandy loam		9	8½
Robert Camplin	Grey	Clay loam	Winter wheat	12 1/16	12
Henry McKinney	Wellington	Gravel	Potatoes	15½	19½
Thos. L. Leslie	Peel	Black loam	Oats	15	15½
David Carstairs	Northum'land	Clay loam	Bare fallow	14	13
Jacob Longhead	Grey	"	Peas	25½	17
Orlando Reid	Oxford	"	Wheat	14	12
Hugh Lamont	Huron	Sandy loam	Peas	10½	8
John Turnbull	Perth	Clay loam	Corn	8	7
Richard Reynolds	York	Rich clay loam	Bare fallow	8	10
Wm. Mowbray	Lambton	Good clay	Bare fallow	10½	10
A. J. Turner	Bruce	Clay loam	Pasture	12½	9¼
N. Drummond	Simcoe	Black clay loam	Potatoes	8	5
Benj. Sheriff	Bruce	Clay loam	Peas	11	9
David Gorman	Lambton	"	Oats	12	3
Benj. Parker	Lambton	"	Oats	14	10
Matthew Crawford	Ontario	Clay	Barley	15	13
Purdom Wilson	Peel	"	Mixed grain	16	15

CONCLUSIONS.

1. Both the American Bronze and the Jones' Winter Fyfe gave higher yields per acre than the Canadian Velvet Chaff in the co-operative tests, and also upon the experimental plots at the Station.

2. The American Bronze gave a greater yield of grain than the Canadian Velvet Chaff in sixteen out of twenty-six co-operative experiments.

3. The Jones' Winter Fyfe gave a greater yield of grain than the Canadian Velvet Chaff in twenty-six out of thirty-three co-operative experiments.

4. The Early Red Clawson, Lancaster, Red Velvet Chaff, Hybrid Mediterranean, Garfield and Golden Cross made the best average yields among the other varieties tested.

A somewhat lengthy discussion took place regarding the relative merits of the different kinds of fertilizers, corn, roots and grain, also regarding the great value of the experimental work of the Union to the farmers of Ontario.

RECENT PROGRESS IN AMERICAN HORTICULTURE.

The following paper was read by Prof. L. H. BAILEY, Professor of Horticulture, Cornell University Experiment Station:

You have asked me to say something about recent progress in horticulture. I am at a loss to know how you want the subject treated. The subject is a large one and can be approached in many ways. It is by no means admitted that there is any recent progress. There is a large class of our horticultural public which disparages these modern times as in no way so good as those of several or many years ago. These men are mostly gardeners who were apprenticed in their youth. There is another class which decries the introduction of new varieties of plants, thinking these novelties to be unreliable and deceitful. There are others who are content with the older things and who have never had occasion to ask if there has been any progress in recent years. Others have looked for progress, but have not found it. A professor of horticulture told me a few days ago that nothing new nor interesting seems to be transpiring in the horticultural world. Some people even deny outright that any progress is making at the present time. On the other hand, there are some, perhaps the minority, who contend that they see great advancement. Perhaps these are mostly young men. Then there are the catalogues with their fascinating impossibilities, pregnant with the glory that is to come. Between all these diversities, where is the young man to stand who loves plants and sunshine and is yet ambitious? Is there any progress in horticulture? If not, it is dead, uninspiring. We cannot live on the past, good as it is; we must draw our inspiration from the future. This subject is of vital personal interest to me; it must be so to you.

I cannot forego the satisfaction of saying at the outset, that some of this supposed stagnation must be due to blindness on the part of the observer. The apprenticed gardener underwent in his youth the stupendous misfortune of having learned the art and science of horticulture. The apprentice system, in itself, does not often educate a man; that is, it does not make him a student. It teaches him to base the whole art upon rule, personal experience and "authority;" it is apt to make him a narrow man, and he may not readily assimilate novel methods. Those who have looked for progress and have not found it, may have looked in the wrong place. It is possible that they do not understand very clearly just what progress is. Those who are simply indifferent exert little influence upon our inquiry and may be omitted. Those who see progress upon all sides may be over-sanguine. Perhaps they project something of their own passion into their statements, and the catalogues, being for the most part editorial rather than horticultural productions, may be liberally discounted as evidence. It is apparent, therefore, that we must make independent inquiry if we are to answer our own question. Several considerations incline me to believe that progress is not only making, but that it is making very rapidly. And I may say here that I care little for any facts or illustrations of pro-

gress merely as facts. There must be some law, some tendency, some profound movement underlying it all, and this we must discover. I shall not attempt, therefore, to indicate how great the progress has been in any definite time, but endeavor to ascertain if there is progression which gains impetus with the years.

1. *There is a progressive variation in plants.* Horticulture is the science of cultivation of plants. The plant is the beginning and the end. For the plant we till the soil, build greenhouses, and transact the business of the garden. All progress, therefore, rests upon the possibility of securing better varieties, those possessing greater intrinsic merit in themselves or better adaptations to certain purposes or regions. In other words, all progress rests upon the fact that evolution is still operative, that garden plants, like wild animals and plants, are more or less constantly undergoing modification. American horticulture may be said to have begun with the opening of the century. It was in 1806 that Bernard McMahon wrote his *American Gardener's Calendar.* This work contains a catalogue of 3,700 "species and varieties of the most valuable and curious plants hitherto discovered." Among the cultivated varieties of fruits and vegetables, the present reader will see few familiar names. He will observe among the fruits, however, some American types, showing that even at that date American pomology had begun to diverge from the English and French which gave it birth. This is especially true of the apples, for of the 59 kinds in the catalogue about 66 per cent. are of American origin. Several nurseries were established in the next thirty years and fresh importations of European varieties were made, so that when Downing, in 1845 described the 190 apples known to be growing in this country, American varieties had fallen to 52 per cent. In 1872, however, when almost 2,000 varieties were described in Downing's second edition, the American kinds had risen to 65 or more per cent, or to about the proportion which they occupied at the opening of the century. At the present time, the per cent. of varieties of American origin is much higher, and if we omit from our calculations the obsolete varieties, we find that over 80 per cent. of the apples actually cultvated in the older apple regions at the present time are of American origin. The percentage of native varieties, in other words, has risen from nothing to 80 per cent. since the apple settlement of the country, and at least once during this time the native productions have recovered from an overwhelming onslaught of foreigners. Except in the cold north and north-west where the apple industry is now experiencing an immigration not unlike that which befell the older states early in the century; few people would think of importing varieties of apples with the expectation that they would prove to be a commercial success in America. Other plants have shown most astounding development. In 1889, 39 varieties of chrysanthemums were introduced in North America; in 1890, 57 varieties; and in 1891, 121 varieties. The chrysanthemum is now the princess of flowers, yet in 1806 McMahon barely mentioned it, and there were no named varieties. All this is evidence of the greatest and most substantial progress, and much of it is recent; and there is every reason to believe that this rapid adaptation of plants to new conditions is still in progress in all cultivated species In fact, the initial and conspicuous stage of such adaptation is just now taking place in the Russian apples in America, in which the American seedlings are even now gaining a greater prominence than some of their parents. Both the parent stock and the seedling brood are radical and progressive departures of recent date. The same modification to suit American environments is seen in every plant which has been cultivated here for a score or more of years. The mulberries are striking examples, for our fruit-bearing varieties are not only different from those of Europe, whence they came, but many of them belong to a species which in Europe is not esteemed for fruit.

The European varieties of almonds are now being superseded in California by native seedlings which are said to be much better adapted to our Pacific climate than their recent progenitors. These facts of rapid adaption are everywhere so patent upon reflection that I need not consider them further at this time. They are indisputable evidence that there is permanent contemporaneous progress, and upon them alone I am willing to rest my whole argument.

There is another feature of this contemporaneous variation which must be considered at this point,—the great increase in numbers of varieties. This increase is in part simply an accumulation of the varities of many years, so that our manuals are apt to

contain descriptions of more varieties than are actually cultivated at the time. But much of this increase is an actual multiplication of varieties. That is, there are more varieties of all plants in cultivation now than at any previous time. McMahon mentions six beets as grown at his time; in 1889, there were 42 kinds. Then there were 14 cabbages; now there are over 100. Then there were 16 lettuces against 120 now. He mentions 59 apples; now there are about 2,500 described in this country. He mentions 40 pears, against 1,000 now. There were over 450 species of plants native to the United States mentioned by McMahon; now there are over 2,000 in cultivation. These figures are average examples of the marvellous increase in varieties during the century. I may be met here with the technical objection that McMahon did not make a complete catalogue of the plants of his time. This may be true, but it was meant to be practically complete, and it is much the fullest of any early list. Gardening occupied such a limited area a century ago that it could not have been a burdensome task to collect very nearly all the varieties in existence; and any ommissions are undoubtedly much over-balanced by the shortcomings of the contemporaneous figures which I have given you. It is certainly true that during the nineteenth century varieties of all the leading species of cultivated plants have multiplied in this country from 200 to 1,000 per cent. This variation still continues, and the sum of novelties of any year probably exceeds that of the preceding year. Every generation sees, for the the most part, a new type of plants.

But I suppose that these statements, as to the increase of varieties, will be accepted without further proof. The question which you all desire to ask me is whether all this increase represents progress. Many poor varieties have been introduced, beyond a doubt, but I am convinced that the general tendency is decidedly progressive. You may cite to me the fact that we have not improved upon the Rode Island Greening and Fall Pippin apples, the Montmorenci cherry, the Green Gage plum, and other varieties which were in cultivation at the opening of the century, as proof of a contrary conviction; but I shall answer that we now have a score of apples as good as the Greening, although we may have none better. This habit of saying we have not improved upon certain old plants is really a fallacy, for the reference is always made to quality of fruit alone; and furthermore the test of progress is not the supplanting of a good variety, but the orgination of varieties which shall met new demands. The more numerous and diverse the varieties of any plant, the more successful will be its cultivation over a wide area, because the greatest number of different conditions—as soils, climates, the uses—will be satisfactorily met. If we had at present only the apples which were grown in McMahon's time, apple culture in the prairie States, in our bleak North-west and even in some of the apple sections of Ontario, would be impossible. We are constantly extending the borders of the cultivation of all fruits by means of these new varieties. The horticultural settlement of our great west and of the cold north is one of the wonders of the time. We should not ask ourselves of a new variety if it is better in all respects than other varieties, but if it will fill some specific need more satisfactorily. If a variety does better than all other varieties, in one locality alone, for one specific purpose, it is not a failure, and it represents progress. Every peculiar or isolated region tends to develop a horticulture of its own, but this is possible only with a corresponding initial variation in plants.

No doubt many of our discarded varieties failed to find the place or conditions in which they would have succeeded. We should not look upon adverse reports upon the novelties as necessarily denunciatory; they may only indicate that in some places or for some purposes the variety in question is unsatisfactory.

I must also call your attention to the fact that while the areas of cultivation have greatly widened in recent years because of the evolution of adapted varieties, the economic uses of the plants have increased in like ratio. We now have varieties of fruits which are specially adapted to the making of dried fruit, to canning, to enduring long journeys, and the like; and flowers which meet specific demands in decoration or other uses. The period of maturation of varieties has extended greatly in both directions, so that fruits and flowers are now in season much longer than formerly. The gist of the whole matter is simply this, that our horticultural limits and products have greatly broadened in very recent times by reason of great increase in number and diversity of varieties; and this

leads us to expect that still other wants will be met in like manner, and that the uttermost habitable parts of the country will develop a special horticulture.

2. *There is a constant augmentation in new specific types of plants, both from our native flora and by importations from without.* I suppose that there is no parallel to the marvellous evolution of native fruits in America. Within a century we have procured the grapes, cranberries, the most popular gooseberries, some of the mulberries, the raspberries and blackberries, the pecans and some of the chestnuts from our wild species. Perhaps the strawberries can be traced to the same source. There are many men still living who remember when there was no commercial cultivation of these fruits. Here is progress enough for one century; yet an overwhelming host of new types is coming upon us. I sometimes think that the improved native plants are coming forward so rapidly that we do not properly appreciate them. Witness the perplexing horde of native plums, the varieties even now reaching nearly 200, which are destined to occupy a much larger area of North America than the European plum now occupies. New species of grapes are now coming into cultivation. The dewberries, juneberry, Crandall currant type, buffalo berry, wild apples, and more than a score of lesser worthies, are now spreading into our gardens. Many of these things will be among the staples a hundred years to come. One hundred and eighty-five species of native plants, some for fruit but mostly for ornament, were introduced into commerce last year; and the number of plants native to North America north of Mexico, which have come into cultivation is 2,416. Under the stimulus of new conditions some of the species will vary into hundreds, perhaps thousands of new forms, and our horticulture will become the richest in the world. It is a privilege to live when great movements are conceived and new agencies first lend themselves to the dominion of man.

Many species have come to us from many parts of the world throughout the century, but the immigration still continues and perhaps is greater now than at any previous time. It is well-nigh impossible to chronicle the new types of ornamental plants which have come to America during the last two decades. Consider the overwhelming introduction of species of orchids alone. Even the wholly new types of fruits are many. Over twenty-five species of edible plants have come to America comparatively recently from Japan alone, and some of these species are already very important. Two of them, the Japanese persimmons and the Japanese plums, are most signal additions, probably exceeding in value any other introductions of species not heretofore in the country, made during the last quarter century. During the years, 1880, 1890 and 1891, some 380 species of plants not in commercial cultivation here were introduced in North America, partly from abroad and partly from our own flora. In the year 1891 alone, 219 distinct species were introduced.

Valuable as these new types are in themselves, all experience teaches that we are to expect better things from their cultivated and variable progeny. We can, therefore, scarcely conceive what riches the future will bring.

3. *There is great progress in methods of caring for plants.* The manner of cultivating and caring for plants has changed much during recent years. It is doubtful if all this change represents actual progress in methods, but it indicates inquiry and growth, and it must eventually bring us to the ideal treatment of plants. Some of the change is simply a see-saw from one method to another according as our knowledge seems to point more strongly in one direction than another. In one decade we may think lime to be an indispensible fertilizer, and in the next it may be discarded; yet we may eventually find that both positions are untenable. Yet there has been a decided uplift in methods of simple tillage and preparation of land and the science of fertilizing the soil; and moreover, the application of this knowledge is widespread where it was once local or rare; and the application of machinery and mechanical devices to almost every horticultural labor cannot have escaped the attention of the most careless observer.

Among specific horticultural industries, the recent evolution of the glass house has been remarkable. In 1806, the greenhouse was still a place in which to keep plants green, and McMahon felt obliged to disapprove of living rooms over it to keep the roof from freezing, because they are "not only an additional and unecessary expense, but they give the building a heavy appearance." The first American greenhouse, with a wooden roof and heavy sides, was built in 1764. Glass houses increased in numbers very slowly until

the middle of this century, and they can only now be said to be popular. Twenty years ago a glass house was a luxury or an enterprise suited only to large concerns, and the management of it was to most intelligent people an impenetrable mystery. At the present time, even the humblest gardener, if he is thrifty, can afford a greenhouse. In fact, the glass house is rapidly coming to be an indispensible adjunct to nearly all kinds of progressive gardening. The secret of this increasing popularity of the glass house is the simplicity of construction of the modern building. Large glass, low straight roofs, light frames, simple foundations, small wrought-iron pipes, portable automatic heaters—these are the innovations which have given the greenhouse a greater popularity and practicability in America than anywhere else in the world. Yet many of these features would have been heresies when Leuchars wrote his excellent book in 1850.

The simplification and popularization of the glass house has simplified the management of plants in them. Even laymen are now taking to greenhouse plant-growing and many of them achieve most gratifying results. The first days of the commercial forcing of plants are still within the memory of many in this audience ; and it is only within the present decade that great attention has been given to this country in the forcing of tomatoes, cucumbers, carnations, and many other plants. The business is yet in its infancy. The greenhouse has also exerted a marked influence upon the plants which are grown in them. There has now appeared a list of varieties of various plants which are especially adapted to the purposes of forcing ; and this phenomenon is probably the most important and cogent known proof of contemporaneous evolution.

If one were asked off-hand what is the most conspicious recent advancement in horticulture, he would undoubtedly cite the advent of the sprays for destroying insects and fungi. These are not only eminently effective, but they were perfected at a time when dismay had overtaken very many of our horticulturists, and they have inspired new hope everywhere, and have stimulated the planting of fruit and ornamentals. I fancy that the future historian will find that the advent of the spray in the latter part of this century marked an important epoch in agricultural pursuits. Yet this epoch is not disconnected from the era before it. It is but a natural outcome or consequence of the rapid increase of insect and fungus enemies, which increase, in turn, is induced by the many disturbing influences of cultivation itself. When we devise effective means of ckecking the incursions of our foes, therefore, we are only keeping pace with the initial progress fostered by the origination of new varieties and the quickening commercial life of our time. Yet the area of spraying is none the less a mark of great achievment, and we have not yet seen the good of which it will ultimately prove to be capable. But a greater achievement than this must be made before we shall have reached the ideal and inevitable method of combatting external pests : We must learn to so control natural agencies that one will counteract another. Nature keeps all her forces and agencies in comparative equilibrium by putting one against another in the remorseless struggle for existence. The introduction of insect parasites and predaceans, entomogenous fungi, colonization of insectivorous birds, and the use of strategy in cultivation and in the selection of immune species and varieties, and the planning of rotations and companionships of plants, will eventually be so skillfully managed that most of our enemies will be kept under measurable control. A short rotation is now known to be the best means of combatting wire-worms and several other pests. The first great success in this direction in America is the introduction of the Australian vedalia, or lady-bug, to devour the most pestiferous of the orange tree scales on the Pacific coast. This experiment is pregnant of greater and more abiding results than all the achievements of the sprays. But in your generation and mine, men must shoulder their squirt guns as our ancestors shouldered their muskets, and see only the promise of the time when they shall be beaten into pruning hooks, and plowshares and there shall come the place of a silent warfare.

4. *There is great progress in the methods of handling and preserving horticultural products.* I need not tell the older men in this audience that there has been progress in methods of handling fruits. When they were boys, apples and even peaches were taken to market loose in a wagon-box. We have all seen the development of the special package industry, beginning first with rough bushel baskets or rude crates, then a better made and smaller package which was to be returned to the consigner, and finally the trim and

tasty gift packages of the present day. I am sorry to say that some regions have not yet reached this latter stage of development, but their failure to do so only makes the contrast stronger of those who have reached it. Quick transportation and methods of refrigeration have tied the ends of the earth together. Apples in quantity are carried 14,000 miles from Tasmania to England, and in 1890 they reached the San Francisco markets to compete with the fruits of the Pacific coast. From a small beginning in 1845, the exportation of American apples to England and Scotland began to assume commercial importance from 1875 to 1880, until nearly a million and a half barrels have been exported in a single season. It is said that the first bananas were brought to the United States in 1804, and the first full cargo in 1830. Now from eight to ten million bunches arrive annually. The Canary Islands are now shipping tomatoes to London, and the United States will soon be doing the same. Watermelons will follow. California now unloads her green produce in the same market. Even pears are exported from America to Belgium, disputing the old saw that it is unwise to carry coals to Newcastle. The world is our market. This result may have been achieved with some detriment to home markets and transportation, which have been in some measure overlooked and neglected; but this evil must correct itself in the long run.

Perhaps we owe to a Frenchman the first distinct exposition, some eighty years ago, of the process of preserving perishable articles in hermetically sealed cans; but the process first gained prominence in the United States, and it became known as canning. In 1825, James Monroe signed patents to Thomas Kensett and Ezra Daggett to cover an improvement in the art of preserving, although Kensett appears to have practiced his method somewhat extensively as early as 1819. Isaac Winslow, of Maine, is supposed to have been the pioneer in canning sweet corn, in 1842. About 1847 the canning industry began to attract general attention, and in that year the tomato was first canned. The exodus to California in 1849 stimulated the industry by creating a demand for unperishable eatables in compact compass. North America now leads the world in the extent, variety and excellence of its canned products, and much of the material is the products of orchards and gardens. In 1891, the sweet corn pack of the United States and Canada was 2,799,453 24-can cases, and the tomato pack was 3,405,365 cases. Over 20,000 canning factories give employment, it is said, to about one million persons during the canning season. The rise of the evaporated fruit industry is not less remarkable in its way than that of the canning industry.

There are other marvels of progress in methods of caring for horticultural products, but these examples sufficiently illustrate my position. I am aware that all these things are features of commerce and manufacture rather than of horticulture, but they are responsible for much of the phenomenal extension of horticultural interests in recent years. They have also exerted a powerful influence upon the plants which we cultivate, and varieties have appeared which are particularly adapted to long carriage and to canning and evaporating. The vegetable kingdom is everywhere responsive to the needs of man.

5. *There is a corresponding evolution in the horticulturist.* The rapidity with which education and general intelligence have spread in recent years is patent to everyone. The rural classes have risen with the rest, but among the agricultural pursuits horticulture has probably shown the greatest advance in this respect. The horticulturist grows a great variety of products, many of which are perishable, and all of which demand expedition, neatness and care in marketing. And these many and various crops bring in a multitude of perplexities which not only demand a ready knowledge for their control, but which are important educators in themselves. The horticulturist lives nearer the markets and the villages than the general farmer; as a rule, and he is more in touch with the world. Downing rejoiced in 1852 that there were "at least a dozen societies in different parts of the union devoted to the improvement of gardening, and to the dissemination of information on the subject." Since that time a dozen national horticultural societies, of various kinds, have come into prosperous existence, and there are over fifty societies representing states, provinces or important geographical districts, while the number of minor societies runs into the hundreds. Over fifty states, territories and provinces have established agricultural schools and experiment stations, all supported by

popular sentiment. The derision of "book farming" is well nigh forgotten. Subjects which a few years ago were thought to be "theoretical" and irrelevant, are now matters of common conversation. In short, a new type of man is coming on the farms. This uplift in the common understanding of the science of cultivation, and of the methods of crossing and of skillful selection, is exerting a powerful accelerating influence upon the variation of cultivated plants. But the most important and abiding evolution is that of the man himself; and I expect that the rising intellectual status will ultimately lead people to the farm rather than away from it. We are just now living in a time of conspicious artificialism; but the farm must be tilled and it must be inviting. When agriculture cannot pay, something is wrong with the times.

These, then, are the chief lines of progress in horticulture, and they are still operative and capable of indefinite growth. The achievement of a generation has been phenomenal. The prospect is inspiring to both the cultivator and the student.

Prof. JAMES: We have frequently seen the statement that the process of canning is much older than is generally supposed, and that the hint came from some of the old cities—that it was suggested from some discoveries from Pompeii. Is that so? I think it would be exceedingly interesting if Prof. Bailey would give us some information as to what he has been contributing in his own work to this horticultural development. Our schools take up the development of almost everything else except that of agriculture, and it is very refreshing indeed when our attention is turned to this line.

Prof. BAILEY: In regard to the canning industry, the statement has been made that the canned products which were found in the old cities have been the starting point of the evolution of canning in recent years. This was gone over pretty carefully by a writer some three or four years ago, and he concludes that it is not true, from the fact that the cans of the Romans were not unearthed, or at least not generally known, until after the initial progress of canning had taken place in France. In 1810 the French Government found some method of preserving vegetables. So far as we know this was the starting point of our modern development. But it is essentially an American institution. In regard to the historical development of agriculture, I may say that I am not discouraged because the agricultural schools have a comparatively small attendance. In our institution, of about 1,700 students, we have at present only 50 or 60 in agriculture. It seems certainly a very small proportion; but of course there are certain valid reasons why we have so few. We must remember the fact that the evolution of education everywhere shows that whenever anything new has been set on foot it has gained progress exceedingly slowly during its youth. If you were to look up the history of mechanical education, you would find that that had this same difficulty in the first—that there was this long period of incubation during which there was very little progress. The incubation was not so long as in agriculture however. In the first place, the farmer, of all other people, has been the one who has been conservative; and I think the conservatism of the farmers of the United States, at least, is the one salvation of our nation. They are the ones who move slowly, who take new ideas not upon trust but on experience; and when they do grasp them they grasp them with fervor. When the farmer does wake up to the fact that agricultural education is essential then he will have it at almost any sacrifice. For myself, I am not discouraged that we have so few students; I am rather encouraged to think that we have any at all. When we consider the fact that a large part of the educational development of our country has not been in the direction of the farming community, but in the direction of the professions and manufacture, it seems to me that it is a wonder that we have even so many in the Agricultural Colleges as we have. It is not so much a matter of love for the farm which draws the young men to the College as it is the uncertainty as to whether they can make money off the farm. Just so soon as we show them that money can be made, so soon do we expect our farmers' sons to go to College. In New York State we have a different class of young man than in some States. In Michigan, the farmers' boys who came were nearly all those who expected to earn a farm when they got through the institution. In New York State, where we have a good deal of inherited wealth, we have some who are not to be the actual farmers themselves, but who are to be the

owners and managers of land. Some of them do not come with the idea that they shall be made into farmers, but with the expectation that they shall be educated.

Mr. HUTT: What are you doing in the line of experimenting?

Prof BAILEY: The experiment stations of the United States are endowed by an annual appropriation of $15,000 from Washington; it was a part of the provision by law that this $15,000 should go to every State that desired to have it; and where there were in existence two agricultural colleges in the one State, or an agricultural college and an experiment station, the Legislature decides to which of these the grant shall go. In New York this annual grant goes to Cornell. This national grant we think is a great advantage, because we are not dependent upon the votes of the people of the State in which we live for support. Thus we can lay out such experiments as we wish, as the influence of electric light upon plant growth, which, perhaps, for a series of ten or a dozen years may not give any distinct results, but which may be profitable in the end. The Agricultural College was founded with Cornell University in the sixties. Thus we have the two organizations at the present time—the Agricultural College as part of Cornell University, and we have connected with this the Agricultural Experiment Station. Now, since the Agricultural Experiment Station came, we have reorganised our College of Agriculture, so that it is composed of two parts, College and Experiment Station. Therefore we are bound by the very terms of our existence to do both teaching and experimenting. In some States these two features are kept entirely separate, and different men employed in each department, but in our institution the same men carry on both. I have an assistant to do the teaching for me, and an Experiment Station foreman to carry on the experiments; and this is the way with all the departments. The College of Agriculture, while it is a distinct institution, is also a part of the University at large, and some of the instruction is given by the general University. It is required that all the agricultural students have political economy and mathematics, and some of the University professors instruct agricultural students in these branches. Some of my teaching has to do with the evolution of plants, and some of the students come over to me from the University proper for specific instruction in those things relating to natural history. The experiment station itself came late in the life of the University. Our land is very rolling and very varied in character of soil. We have no place on the whole 25 acres devoted to horticulture as large as 50x60 feet which is continuous in slope or soil.

As our long vacation comes in the summer time, and when the teachers are away, and as we have a considerable glass space and student help, we carry on various kinds of experiments during the winter season. This matter of cultivation of vegetables under glass is after all an important matter. This experiment with the electric light is the largest that has ever been carried on. We find that it commercially pays to grow lettuce by electric light. We find that some plants will grow and some will not under its influence. Lettuce will grow very rapidly, while a radish plant in the same position will not grow so rapidly. Some parts of the electric light are more useful to some plants than to others. We have one electric light which is surrounded by a globe which has different colored glass on different sides, and this is put in the centre of a room and the plants are grown around it, and we are trying to find out what part of the electric light exerts the greatest benefit upon plants. Under the orange light the plants are growing very well, but under the blue light they are not doing well.

Prof. PANTON: I am sure we have all listened with interest to what Prof. Bailey has said, and the practical part is probably along the line in which Prof. Bailey is distinguishing himself more than in any other. What have you done along the line of hybridizing—along what lines have you been the most successful?

Prof. BAILEY: I might say first that I have seen conservatories in all parts of the world, but I never saw one that pleased me as much as that at this Station. The character of those begonias and other flowers captivated me this morning. In regard to hybridizing, you understand of course that I am yet too young to say anything about it. All that we think we learn one year is sometimes unlearned the next year. In 1886 I began some experiments with squashes. I succeeded in getting a most remark-

able squash—a good deal larger and better in every way than the ones from which it came; but if I were to tell you how many kinds I got from the seeds of this the next year it would surprise you. I planted every individual seed of that squash, which made a whole field of nearly two acres, and every blessed plant was different—I counted 110 distinct kinds from the seed of the one squash and several intermediate kinds which I could not group. Nearly all my endeavors during the past two or three years have tended more to the evolution of myself than the plants with which I have worked. We have, however, made some distinct progress; and I suppose if there is any one thing in which we have obtained more striking results than in any other it is the hybridizing of corn. The plant which we know as Indian corn is supposed to be the only plant of its genus, and as hybridization refers properly to crossing between two distinct species of plants, therefore there can be no such thing as hybridizing in corn. In 1888 a man in Mexico found a new type of corn which he thought was the aboriginal form of Indian corn. This plant was sent to Harvard, and two or three seeds of it were sent to me. The seeds which I had did not grow, and the people at Harvard had little better success. Two or three of the seeds, however, were saved over, and it was grown again at Harvard and at Cornell. The plant was studied by the late Sereno Watson, who called it *Zea Canina*, or dog-tooth corn. The important feature of this species is that the ears branch—a single central stock from this will grow various arms, one above the other, which may be five or six in number, and each arm will produce four or five ears. Of course, these ears are very small, not larger than the ordinary pop-corn. We had difficulty in maturing ours. Last year my attempts to hybridize this corn with sweet corn produced one kernel of corn; this we called the $100 kernel of corn! We got fourteen kernels in hybridizing with another corn which comes from Japan. This Japanese corn has a very peculiar appearance, the leaves being striped with white. We got a cross between this wild corn and the Japanese corn. This has given us remarkable results. Our corn this year averaged from 20 to 35 ears for every seed. The fact that these long arms have been shortened so that they hang in clusters, like a brace of fish, is very important. One of our plants produced 35 different ears from one seed, and we have matured about 20 ears from one seed. If this were given to the world, people would send to us for kernels of the corn, and perhaps next year there would not be any such thing. You get a certain thing this year that appears to be very remarkable, and the next year it may revert or disappear. We are to plant a large area of this corn next year, and we shall attempt to pick out those stocks which have held their characteristics most steadily, and upon some of these plants we shall practice cross-pollenization. We also have carried on experiments between cabbages, and kales, and cauliflowers, etc.. We now have one house in which we have these crosses between cauliflowers and cabbages growing. So far as I know, a cross between a cabbage and a turnip would not take. Cauliflowers form a thick head, a thickened flower cluster, and the cabbage is the solid lapping in of leaves. The crosses are neither cabbages nor cauliflowers, but the peculiar thing is that they all wish at first to be cabbages, but they break early into flower. The probability is that the results will be nothing valuable so far as cabbages and cauliflowers are concerned. We have succeeded in getting some most remarkable turnip crosses. I may say that the real value of crossing lies not so much in the novelties which we get as in the fact that it infuses fresh vigor into the progeny. In every case the best plants which we have come from crosses. For instance, we have taken two lots of geraniums, and the seedlings which came from these varieties are better than from either parent.

A MEMBER: What success have you had with cucumbers?

Prof. BAILEY: The cucumbers which we grow are the long English varieties. Our ordinary field cucumbers will not grow very well under glass during the winter. The peculiar point is that they will sometimes grow without any seeds or pollen. By withholding pollen from them you can frequently grow them nearly solid and entirely seedless. In the greenhouse, however, we find that some plants refuse to bear fruit unless the pollen is applied to some extent. You know that the influence of pollen upon a fruit is two-fold; first, it fertilises the ovules or seeds and causes the fruit to grow larger;

and secondly, it stimulates the development of the fruit or pericarp. In the house we have to pollenate our plants artificially, because there are no insects or winds to do it.

Prof. JAMES: What line do you think would be the most profitable for the young men to carry out on their farms in connection with this Union in horticultural lines?

Prof. BAILEY: I should imagine that in your series of investigations a profitable one would be to go into a good co-operative test of varieties of different fruits. In your case you have your experimenters spread over the province. I must say that I have been astonished at the work done by this Union.

Prof. MILLS: What is your opinion in regard to the effect of the change of temperature during the twenty-four hours in our greenhouses? Say the temperature is 65° in the day and 40° to 45° at night, are the plants injured by that change, or should they be kept about the same temperature all the time?

Prof. BAILEY: That depends entirely upon the character of the plants. There are no plants that ought to have the same temperature during the day and night. In tomatoes and cucumbers, which require a warm temperature, we find that such change is a decided advantage. In the day time we keep the temperature not lower than 70°, and at night not below 60°. I prefer some change. I suppose that in ordinary conservatories a difference of 20° would not make much difference.

Prof. MILLS: How do you apply bottom heat?

Prof. BAILEY: By running the pipes or returns back underneath the benches. For some plants, as lettuce and radishes, I prefer no bottom heat, but tomatoes and cucumbers demand it.

Mr. WELD: Can you raise tomatoes with profit in winter?

Prof. BAILEY: Yes, but it is more profitable to grow something between them. It depends entirely of course upon the market. If we can sell them for 40c. per lb. during the winter it is profitable in New York, but if you cannot it is not.

WHAT CAN BE DONE TO IMPROVE THE SOCIAL CONDITION OF THE FARMING COMMUNITY.

By D. BUCHANAN, B.S.A., TORONTO.

There are at present many barriers in the way which retard progress in the development of the social side of the agriculturist's character, and the lack of opportunity for this development has greatly hindered the progress of agriculture by causing many of the best sons of the farm to seek some other way of earning a livelihood which affords an opportunity for social development. The first barrier to be removed in clearing the way for social advancement amongst agriculturists is hard times. It is useless to talk of social training for people who require to work fifteen hours a day to make ends meet. When agriculturists become prosperous they are then in a position to make social advancement. The condition of the markets and the way in which they are regulated materially affects the farmer's prosperity. Another important factor in bringing about prosperity is the universal adoption of the more modern and advanced methods of farming. The farmer in Eastern Canada should as a rule market his produce in the form of meat, cheese, butter eggs etc.; he must part with it a finished product as far as possible and at seasons when the market is best; he must have a thorough knowledge of all branches of work which he undertakes so that he may not lose in one department what he makes in another; he must be a shrewd business man, and requires to keep abreast of the times. The facilities which will aid him in becoming thoroughly master of his business are numerous. There are first our agricultural colleges, and it to be regretted that any young man will start out to make farming his life work without, if at all possible, having taken a course at a first-class agricultural institution. Again,

there are our agricultural journals, the usefulness of which is far from being fully appreciated; there are our agricultural exhibitions, our experimental stations, our farmers' institutes, and many other sources through which the farmer may obtain information which will enable him to become master of his profession.

After all this, however, there is still something wanting. Supposing that the farmer is possessed of all the qualifications mentioned above he is yet in the same position as was Adam before Eve was created—he wants a helpmate—not a housekeeper, not a female labor performing machine, but a helpmate. Owing to their present condition the female portion of the agricultural community requires attention. While there is a percentage of thoroughly intelligent young women, that is, intelligent along the lines which it is appropriate that farmers' daughters should be, to be found on the farm, the rank and file of farmers' daughters might be divided into two classses First, those who, on account of the monotonous drudgery and secludedness of farm life, have taken to some other line of of work, and, second, those who monotonously plod away on the farm doing work that was never calculated for women's hands and with no scientific knowledge of the work they are performing. The work of the female agriculturist then must be made less laborious, and she must become more intelligent in and more thoroughly mistress of the branches of work which properly come under her supervision, before we have that degree of prosperity amongst agriculturists that is desirable. The idea of young ladies attending dairy schools in this country is talked of by some with a degree of ridicule, yet in Great Britain young ladies are attending dairy institutions, becoming thoroughly mistresses of dairying, and filling positions as instructresses in such institutions. The women might superintend the dairy, but should not be asked to turn the churn crank; they may attend the poultry, but should not be required to clean the poultry house; they should be thorough all-round horticulturists, but using the spade is no job for them. I believe that before many years regular courses of instruction for ladies will be established at our agricultural colleges, which will be greatly appreciated by the fair sex. I am also of the opinion that before five years there will be more ladies than gentlemen taking the special dairy course. When farmers, male and female, have become more prosperous, which implies that they have become intelligent, then considerable progress has been made in their social development.

We must remember, however, in considering this question that social training which is not subservient to intellectual training is usually of little value. In endeavoring to advance socially then let us as a community base our training upon intellectual development. It is impossible under any circumstances for farmers to mix with each other to the same extent that town people may; yet it is possible for them to mingle much more than they at present do, and doubtless to a sufficient extent to give the social bump at least a normal development. Nevertheless the farmer must be a lover of books; he requires to become intimate with science, and by reading he may associate with the leading spirits of this and former ages. An intelligent agriculturist will commune with nature and enjoy her company. We see then the paramount importance of intellectual development in considering the question of social training. Considerations of a different nature which affect this question are the improvement of our public highways and the beautifying of our homes. Why should so many farm houses stand bleak and desolate in the centre of the farms, and why should they not be surrounded by beautifying trees and shrubs? No people have natural advantages for being supplied with tennis courts, etc., as have the agriculturists, and no people are more deserving of the same. The last particular worthy of mention, which is probably one of the most directly effectual, is the universal establishment and active use of mechanics' institutes, farmers' clubs, debating societies, reading circles, etc.

These propositions may appear to some as though they would be difficult to carry out, in fact all the reforms mentioned above look as though they would require many years to work themselves out and bring about with other things the needed social reform, yet we all feel that the agricultural world is at present becoming on fire, and that we are entering upon an era when the progress made in agriculture will far surpass the record of any former period, so that the next quarter of a century may see changes that as yet have never even been thought of.

POULTRY AS A BRANCH OF CANADIAN FARMING.

By Geo. Nicol, Cataraqui, Ont.

The practice of breeding domestic fowls must have been commenced at a very early date, and wherever the art of farming has been introduced do we in some way find associated with it the breeding of various kinds of poultry. Yet it seems by far the greater majority of farmers keep fowls chiefly because of the satisfaction they afford by furnishing supplies of excellent food for home consumption. Comparatively few have studied poultry and raising as a special branch of husbandry. It has now become quite evident that we, the farmers of Ontario, have not fully availed ourselves of the benefits which might be derived from this important branch of agricultural industry.

The annual poultry product of France is estimated at $60,000,000, some $12,000,000 worth of which is exported to England.

The United States poultry products exceed in value the entire cotton, corn, wheat, or hay crops, and is estimated at $300,000,000 annually. Yet, notwithstanding the high tariff, that country imports from Canada a large quantity of poultry and eggs as can be learned from reliable statistics.

In some of our markets at the present time good beef is being sold by the carcass as low as four cents per pound, while poultry of almost all kinds sells readily at from eight to ten cents per pound.

Stale eggs are not, and cannot be worth much at any market, but I know of some farmers who have no difficulty in contracting for supply of fresh eggs at 30 cents per doz.

Two million dozen eggs were imported from Canada last year into the British markets; we have not heard the results, which must have depended very much on the temperature of storage. But one thing we do know is, the market for good fresh eggs is practically unlimited. Thus it will ever be. The profits of the poultry business will depend very much on management. Eggs and slaughtered fowls can be kept in cold storage for almost any length of time, but if kept in a temperature much above the freezing point they soon become unfit for human food.

In regard to the value of different breeds of fowls, there is much difference of opinion. It has not yet been, nor perhaps never will be decided which of all the various breeds is the most profitable under all circumstances. There seems to be a prevailing desire for a general purpose fowl, and with that object in view the Plymouth Rock, Wyandotte, Langshan, and other breeds have been produced by crossing the heavy weight flesh producing with the laying or non sitting breeds.

As a fancier, although discountenancing cock-fighting, I would prefer the Game on account of their noble contour, graceful habits and the excellent quality of their flesh and eggs. If the production of eggs were my leading object, I would prefer the Leghorns, the Spanish, or the Hamburgs, because they lay a greater number of eggs than any of the Asiatic breeds

Where the raising of chickens for market is the chief object, it is not by any means an established fact that the largest kinds are the most profitable, because about in proportion to their size is the amount of food consumed by them. Brahma and Cochin chickens, the chief bulk of which consists of neck and legs, are not worth as much in any market as plump birds of moderate dimensions.

Aside from direct profits which may be derived from the sale of poultry productions, the use of fowls on the farm, especially in the orchard, now that insects injurious to fruit culture have increased to such an alarming extent, is of great importance.

We have now in Canada thousands of distinct species of insects injurious to agriculture, and when we consider that each fowl will during the season daily consume thousands of these insects we may be able to form some idea of the amount of good they do, although perhaps not perceptible to the unobserving.

During some months of the year, the food of turkeys when allowed a large range is chiefly insects, and on them they grow faster and thrive better than when fed on grain in limited space ; hence on many farms turkeys are profitable stock.

In large cities everywhere the increased demand for geese and ducks, has caused a considerable advance in price. All farms are not very well adapted for raising this class of fowls, but wherever there is a constant supply of water they can be raised with advantage, and the supply is not likely to exceed the demands.

Taking many things into consideration I think it is very doubtful whether at the present time any other branch of business connected with the farm is more satisfactory than the production of poultry and eggs.

A committee composed of Messrs. Lick and Zavitz was appointed to wait upon the Minister of Agriculture to urge the claims of the Association with a view of obtaining an increased grant, and also better facilities for carrying forward the experimental work of the Union.

As some changes have been made in the Constitution since its last publication several of the members spoke of the importance of having it again printed in the report of the Association.

Mr. Zavitz moved a vote of thanks to the gentlemen who were so kind in taking part in the different sessions of the meeting, making special mention of Prof. Bailey, Mr. Shutt, Mr. J. J. MacKenzie, Mr. John Burns and Mr. John Hannah. President Mills said he took much pleasure in seconding the motion made by Mr. Zavitz.

CONSTITUTION AND BY-LAWS OF THE EXPERIMENTAL UNION.

CONSTITUTION.

ARTICLE I—*Name.*

This organization shall be known as "The Ontario Agricultural and Experimental Union."

ARTICLE II—*Object.*

The object of this Association shall be to form a bond of union amongst the officers and students, past and present, of the Ontario Agricultural College and Experimental Farm; to promote their intercourse with the view of mutual information; to discuss subjects bearing on the wide field of agriculture, with its allied sciences and arts; to conduct experiments in this field in union as far as possible, or by individual efforts; to secure the co-operation of the agriculturists of the province in this work; and to meet at least once annually to hear papers and addresses delivered by competent parties, and to report upon the labors of the past year.

ARTICLE III—*Membership.*

All officers and students of whatever time shall be entitled to become members of the Union on payment of the annual fee, 50 cents, and these shall be entitled to vote, hold office and discuss any question before the Association. The honorable the Commissioner or Minister of Agriculture for the Province of Ontario, the presidents for the time being of the various agricultural societies and farmers' institutes of Ontario, and such parties as the Association deem it advisable to appoint, shall be honorary members of the Union.

ARTICLE IV—*Officers.*

The officers of this Association shall consist of an Honorary President, President, Vice-President, Treasurer, Secretary, Editor, two Auditors, one Corresponding Secretary for each county, and such Committees on experiments as may be found desirable who shall hold office for one year, or until their successors are elected.

ARTICLE V—*Meetings.*

The Union shall meet annually at the Ontario Agricultural College for one or more days, at the call of the President and Secretary.

ARTICLE VI—*Vacancies in Office.*

Vacancies in office by death, resignation or otherwise shall be filled by the Executive Council until the next annual meeting.

ARTICLE VII—*Payments.*

The Treasurer shall pay out money held by him only on order of the President.

ARTICLE VIII—*Amendments.*

This constitution may be amended at any annual meeting by a two-thirds vote of all the members in attendance.

BY-LAWS.

Article 1. The officers of this Association shall be elected by a majority ballot, or, if so decided by a two-thirds majority of those present, the officers may be elected by a show of hands.

Article 2. It shall be the duty of the President to open all meetings of the Association, and preserve order; to call for all reports of officers and standing committees; to put to vote all motions regularly seconded; to decide upon all questions of order, according to the Constitution and By-Laws of the Association and in accordance with parliamentary usage; to provide for the counting of votes at elections; at expiration of his term of office, to deliver an address before the Association; and to appoint Committees unless otherwise decided by a special resolution.

Article 3. It shall be the duty of the Vice-President in the absence of the President, or in the absence of both, it shall be the duty of the Chairman elected by the Association, to perform the duties of the President.

Article 4. The Treasurer shall receive the annual dues, and keep account of all receipts and disbursements.

Article 5. The Secretary shall conduct all correspondence in regard to membership, general meetings, and all the business of the Executive Council, for which purpose he shall be *ex-officio* a member of that Council; he shall also keep the minutes of the general meetings of the Union, and read the same and call the names of the members of the Association at the opening of each annual meeting.

Article 6. The Editor shall receive, revise and attend to the publication of such addresses, articles or papers as may be authorized for publication in the transactions of the Union.

Article 7. It shall be the duty of the Auditors to audit all accounts before the general annua meeting.

Article 8. It shall be the duty of the Corresponding Secretary of each county to make out a list of names and post office addresses of all agriculturists in his county whom he thinks might either assist the Union in experimental work or attend the annual meeting of the Association, and forward it to the Secretary; to write personally to any whose interest he may secure in that way, and to write letters each year at least a month previous to the annual meeting, to a few of the leading papers in his county, setting forth the objects of the Union, and the date and place of the annual meeting.

Article 9. It shall be the duty of every member *throughout the year* to advance the interests of the Union as far as may lie in his power; to report the result of at least one experiment if at all possible, and to invite any agriculturist that he may come in contact with who would be at all likely to attend the annual meeting or assist in experimental work.

Article 10. The Association shall be governed, as far as possible, by the following order of business:

Call to order.
Reading the minutes of the last annual meeting.
Calling the roll of officers and members.
Reception of new members.
Collection of annual dues.
Secretary's report.
Treasurer's report.
Report of standing committees.
President's address.
Miscellaneous business.
Discussion of topics.
Election of officers.
Installation of officers.
Adjournment.

Article 11. The Executive Council shall consist of the Honorary President, President, Vice-President, Treasurer, Secretary and Editor. Its duties shall be to prepare a programme for annual meetings; invite and arrange with parties for the reading of papers; pass the annual report before printing, and transact such other work as has been indicated for it in this Constitution, or which may be hereafter authorized by the general meetings.

Article 12. In all other matters such as motions, etc., at the general annual meeting, the Union shall be governed by Todd's Parliamentary Usage.

Article 13. These By-Laws may be amended by a two-thirds majority of all the members present at the annual general meeting.

THE EXPERIMENTAL COMMITTEES.

It shall be the duty of each Experimental Committee to decide upon its own course of experiments for each year; to purchase and distribute the material to be used by experimenters, and to receive and compile the reports, and submit them to the annual meeting.

LIST OF MEMBERS, 1893.

Name.	Post Office Address.	Province or Country.
Atkinson, James	Seaforth	Ontario.
Aylesworth, David	Bath	"
Armstrong, Christian	Montgomery	Alabama, U. S.
Bell, L. G	Qu'Appelle Station	Northwest.
Brown, W. J	Aylmer	Ontario.
Brown, Robert	Dalbeate	Scotland.
Ballantyne, W	Stratford	Ontario.
Burns, J. H	Kirkton	"
Beckett, H. L	Hamilton	"
Brooks, C	Brantford	"
Buchanan, D	Hensall	"
Brodie, C. E	Bethesda	"
Brown, S. P	Whitby	"
Burns, J. A. S	Broughty Ferry	Scotland.
Bayne, Percy R. C	Beaver Creek	British Columbia.
Bayne, Stanley R. S	"	"
Curzon, A	127 Victoria Street, London	England.
Carrick, C. S	Kincardine	Ontario.
Caldecot, F	Toronto	"
Clunn, W. P	Penarth	South Wales.
Curzon, S	127 Victoria Street, London	England.
Crealy, J. E	Strathroy	Ontario.
Cooper, W. W	Kippen	"
Cowan, J. H	Galt	"
Conn, Jos	Heathcote	"
Cook, J. H	Gordonville	"
Christian, H. H	Solina	"
Carlaw, G	Warkworth	"
Campbell, J. A	Simcoe	"
Dean, F	Harley	"
Dyer, Wm	Brooklin	"
Dunkin, T. L	Norwich	"
Eaton, L W	Dartmouth	Nova Scotia.
Elmes, W. A	Princeton	Ontario.
Elmes, J. H	"	"
Elliot, W	Galt	"
Emigh, Clarence	Holbrook	"
Elton, W	North York	Northwest.
Elliott, R. R	Ottawa	Ontario.
Ferguson, J. J	Smith's Falls	"
Findlay, J. H	Barrie	"
Graessar, F. B	Argold Hall, Llangollen	Wales.
Grant, P	Beecher	Ontario.
Graham, W. R	Belleville	"
Grindly, A. Wolverton	Massawippi	Quebec.
Garbutt, R. A	Peterborough	Ontario.
Gilliland, H. C	St. Catharines	"
Hunter, H. E	Pembroke	"
Harcourt, R	St. Anns	"
Harvey, T. B	Charing Cross	"
Husband, E. M	Cairngorm	"
High, A. M	Beamsville	"
Hutt, H. L	South End	"
Henderson, R. H	Rockton	"
Hurley, T. J	Belleville	"
Harvey, W. H	Exeter	"
Hay, L	Poland	Russia.
Hamilton, C. A	Rugby	England.
Henson, Jas. R	Tullamore	Ontario.
Holtermann, R. F	Brantford	"
Harkness, A. D	Irena	"

LIST OF MEMBERS, 1893.—*Concluded.*

Name.	Post Office Address.	Province or Country.
Harcourt, Geo	Charlottetown	Prince Edward Island.
James, D. A	Nilestown	Ontario.
Jardine, J. E. A	Prince Albert	Northwest.
King, R. E	DeCewsville	Ontario.
Kennedy, P. B	Sarnia	"
Kidd, D. F	Cookstown	"
Kennedy, W. A	Apple Hill	"
Lehmann, R. A	Orillia	"
Lailey, F. T	414 Markham Street, Toronto	"
Logie, A. W	Grantley	"
Lindsay, A. J	Loch Winnoch	"
McCallum, W	Ontario Agricultural College, Guelph	"
McCrimmon, W. D	Glenroy	"
McKenzie, R. V	Lucknow	"
McLean, R. R	Muskoka	"
McNaughton, K	Walkerton	"
McMordie, R	Kippen	"
McKenzie, W. G	Fairview	"
McKay, W. F	Prince Albert	Northwest.
McFie, C. M	Appin	Ontario.
McLean, Malcolm	Ridgetown	"
McKay, T. G	Underwood	"
McLaren, P. S	McGarry	"
Mitchell, H. L	Brampton	"
Monteith, N	Stratford	"
Morgan, R. N	Kerwood	"
Milson, W. G	Goring	"
Maude, Fred. S. A	Leesburg	Florida, United States.
Mattice, W. A	Moulinette	Ontario.
Nelles, N	Grimsby	"
Newman, W. M	Gilbert's Mills	"
Nelson, Jas. A	Lyn	"
Nichol, Geo	Cataraqui	"
Payne, G. Y	Peterborough	"
Pettit, F. E	Burgesville	"
Perry, Eldon	Ottawa	"
Rowe, F	East Dulwich, London	England.
Rathwell, W	Ferguson's Falls, Toronto	Ontario.
Ross, J. G	Barrie	"
Robertson, T. A	Kingston	"
Robertson, Jno	Hatley	Quebec.
Raynor, T	Rosehall	Ontario.
Shaw, R. S	Ontario Agricultural College, Guelph	"
Soule, A. M	Niagara Falls South	"
Shuttleworth, Prof. A. E	Ontario Agricultural College, Guelph	"
Simpson, A. E	Hamilton	Prince Edward Island.
Silverthorn, Chas	Summerville	Ontario.
Shantz, A	Waterloo	"
Story, H	Picton	"
Sutherland, A. D	Fort William	"
Traviss, C. H	Holt	"
Templar, Wm	Jerseyville	"
Willans, T. B		Northwest.
Wooley, D M	Simcoe	Ontario.
Wheatley, Jno	Blackwell	"
Watson, H	Brampton	"
Walker, F	Norwich	"
Wood, R. S	Surrey	England.
Werry, W. J	Tyrone	Ontario.
Webster, F. E	Creemore	"
Watson, Jno. H	Brampton	"
Yarwood, Ed. B	Picton	"
Zavitz, C. A	Ontario Agricultural College, Guelph	"

APPENDIX I.

GRADUATES, ASSOCIATES AND COLLEGE ROLL.

1. Bachelors of the Science of Agriculture, Degree of B.S.A.

University of Toronto.

1890—Brodie, G. A.
1891—Buchanan, D.

1892—Carlyle, W. L.
1891—Cowan, J. H.
1888—Craig, J. A.
1888—Creelman, G. C.

1890—Dean, H. H.

1888—Fee, J. J.
1891—Field, H.

1892—Gibson, D. Z.
1889—Harcourt, G.
1892—Harrison, F. C.
1891—Hewgill, E. A., (*ob.*)
1891—Hutt, H. L
1889—Hutton, J. R.
1892—Hutchinson, J. W.

1889—Lehmann, A.
1891—Linfield, F. B.

1892—Marsh, G. F.
1890—McCallum, W
1890—Monteith, S. N.
1889—Morgan, J. H. A.
1892—Morgan, R. N.

1892—Newcomen, W. F.

1891—Palmer, W. J.
1888—Paterson, B. E.

1889—Raynor, T.

1890—Shantz, A.
1891—Sharman, H. B.
1891—Sleightholm, J. A. B.
1889—Soule, R. M., (*ob.*)

1891—Whitley, C. F.

1888—Zavitz, C. A.

2. Associates.

The total number of Associates up to the present time is 240, as follows :

1888—Austin, A. M.
1880—Anderson, J.
1880—Ash, W. E.
1892—Aylesworth, D.

1881—Ballantyne, W. W.
1879—Bannard, E. L.
1888—Bayne, S. R. S.
1892—†Beckett, H. L.
1892—Bell, L. G.
1888—Birdsall, W. G.
1888—Bishop, W. R.
1889—*Brodie G. A.
1890—Brown, H. H.
1892—Brown, B. C.
1890—Buchanan, D.
1888—Budd, W.
1885—‡Butler, G. C.
1884—Black, P. C.
1882—Blanchard, E. L.
1886—Broome, A. H.
1886—‡Brown, C. R.
1888—Brown, S. P.
1892—Burns, J. A. S.

1886—Calvert, S.
1890—Campbell, C. S.
1877—Campbell, J. A.
1880—Campbell, D. P. L.
1892—Carlaw, W.
1891—Carlyle, W. L.
1884—*Carpenter, P. A., (*ob.*)
1888—Carpenter, W. S.
1892—Carpenter, F. C. S.
1886—Cobb, C.
1880—Chapman, R. K.
1882—Charlton, G. H.
1882—Chase, O.
1879—Clark, J.
1879—Clinton, N. J.
1880—Clutton, A. H.
1890—Cowan, J. H.
1890—‡Cowan, R. E.
1887—Craig, J. A.
1892—Crealy, J. E.
1887—Creelman, G. C.
1878—Crompton, E.

1878—Davis, C. J.
1880—Dawes, M. A.
1882—Dawson, J. J.
1892—*Day, G. E.
1888—†Dean, H. H.
1882—Dennis, J.
1889—Derbyshire, J. A.
1881—Dickenson, C. S.
1890—Dolsen, W. J.
1887—Donald, G. C.
1887—Donaldson, F. N.
1877—Douglas, J. D.
1877—Dunlop, S.
1892—Dyer, W. D.

1892—Eaton, L. W.
1890—Elliott, R.
1888—Elton, C. W.
1888—Elton, R. F.
1882—Elworthy, R. H.
1887—Ewing, W.

1878—Farlinger, W. K.
1886—Fee, J. J.
1890—Field, H.
1881—File, J.
1882—Fotheringham, J.
1883—‡Fotheringham, W.
1879—Fyfe, A.

1883—Garland, C. S.
1889—Gelling, J. A.
1892—Gies, N.
1891—*Gibson, D. Z.
1887—Gilbert, W. J., (*ob.*)
1879—Gillespie, G. H.
1892—Graham, W. R.
1878—Graham, D.
1879—Greig, G. H.
1881—Grindlay, A. W.

1890—Hadwen, G. H.
1891—Haight, W. L.
1882—Hallesy, F.
1892—Harcourt, R.
1888—*Harcourt, G.
1890—†Harcourt, J.
1887—Harkness, A. D.
1891—Harrison, F. C.
1883—Harrison, R. E.
1887—Hart, J. A.

* Gold Medalist. † First Silver Medalist. ‡ Second Silver Medalist.

ASSOCIATES.—*Continued.*

1887—Hart, J. W.
1892—Harvey, W. H.
1888—Heacock, F. W.
1890—Hewgill, E. A., (*ob.*)
1890—Holliday, W. B.
1886—Holtby, R. M.
1880—Holtermann, R. F.
1892—Honsberger, J. D.
1882—Horne W. H.
1888—Horrocks, T. J.
1887—Howes, J. S.
1882—Howitt, W.
1892—Hurley, T. J.
1890—*Hutt, H. L.
1888—Hutton, J. R.

1886—Idington, P. S.

1886—Jeffrey, J. S.
1883—Jeffs, H. B.
1879—Jopling, W.

1888—Knowlton, S. M.

1882—Landsborough, J.
1887—Leavens, D. H.
1884—‡Lehmann, A.
1887—‡Lick, E.
1877—Lindsay, A. J.
1889—‡Linfield, F. B.
1887—Livesey, E. M.
1880—Lomas, J. W.
1878—Logan, T.

1880—Macaulay, H.
1890—Macfarlane, T. W. R.
1885—Macpherson, A.
1886—*Madge, R. W.
1882—Mahoney, E. C.
1884—Major, C. H.
1889—Marsack, F.
1889—Marsack, H. A.
1891—Marsh, G. F.
1877—Mason, T. H.
1890—McKergow, J. G.
1877—Myer, G. W.
1887—Morgan, J. H. A.
1881—Motherwell, W. R.
1885—†Muir, J. B.
1887—McCallum, E. G.
1889—McCallum, W.
1889—McEvoy, T. A.
1885—McIntyre, D. N.
1885—McKay, J. B.
1886—McKay, J. G.

1891—McKenzie, A. G.
1889—McLaren, P. S.
1883—McPherson, D.
1890—Monk, W. D.
1889—Monteith, S. N.
1891—*Morgan, R. N.
1890—Mulholland, F.

1878—Naismith, D. M.
1891—Newcombe, W. F.
1879—Nicol, A., (*ob.*)
1882—Nicol, G.
1882—Notman, C. R.

1877—O'Beirne, A. C.
1887—Orsman, C. P.
1886—Owen, W. H.

1888—Palmer, W. J.
1887—Paterson, B. E.
1883—Perry, D. E.
1891—Perry, E. C.
1881—§Phin, R. J.
1881—Phin, W. E.
1881—Pope, H.
1886—Power, R. M.
1884—Powys, P. C.

1882—‡Ramsay, R. A.
1879—Randall, J. R.
1885—*Raynor, T.
1885—Reid, P.
1889—Randall, W.
1889—Rennie, E. A.
1883—*Robertson, W.
1879—Robertson, J.
1881—Robins, W. P.
1879—Robinson, C. B.
1892—Roper-Curzon, S.
1881—Ross, J. G.
1892—Ruthven, W. A.

1884—Saxton, E. A.
1888—Serson, W. E.
1892—*Shaw, R. S.
1888—Sinclair, J. J.
1882—Silverthorne, N.
1888—Soule, R. M., (*ob.*)
1877—Skyes, W. J.
1883—Schwartz, J. A.
1887—†Scrugham, J. G.
1888—Shantz, A.
1887—Sharman, H. B.
1877—Shaw, G. H.

1882—†Shuttleworth, A. E.
1892—Silverthorn, C.
1884—†Slater, H., (*ob.*)
1887—*Sleightholm, F. J.
1890—Sleightholm, J. A. B.
1885—Smith, E. P.
1892—‡Soule, A. M.
1891—Sparrow, J. C. H.
1891—Spencer, W. A.
1884—Steers, O.
1888—Stevenson, C. R.
1878—Stewart, W.
1892—Story, H.
1882—Stover, W. J.
1886—†Sturge, E.
1888—Sweet, H. R.

1891—Thompson, R. A.
1889—‡Tinney, T. H.
1892—Tolton, J. E.
1879—Toole, L.
1883—Torrance, W. J.
1884—Tucker, H. V.
1885—Thompson, W. D.

1888—Valance, R., (*ob.*)

1879—Warnica, A. W.
1884—Wark, A. E.
1878—Warren, J. B.
1890—Webster, F. E.
1880—§Webster, J. L.
1879—Wells, C.
1890—Wells, E.
1882—Wettlaufer, F.
1891—White, E. F.
1892—Wiancho, A. T.
1891—†Wilkin, F. A.
1879—Wilkinson, J. P.
1888—Willans, T. B.
1888—Willans, N.
1879—Willis, J.
1883—Willis, W. B., (*ob.*)
1888—Wilmot, A. B.
1890—Wilson, F. G.
1882—White, C. D.
1879—White, G. P.
1890—Whitley, C. F.
1890—Wood, W. D.
1884—Wroughton, T. A.

1892—Yuill, A. R.

1886—Zavitz, C. A.

* Gold Medalist. † First Silver Medalist. ‡ Second Silver Medalist.
§ Winner of the Governor-General's Medal—the only medal given that year.

3. College Roll for 1892.

Third Year Students.

Name.	P. O. Address.	County, etc.
†Aylesworth, D	Bath	Lennox, Ont.
†Beckett, H. L	Hamilton	Wentworth, Ont.
†Bell, L. G	Qu'Appelle	North-West Territory.
†Burns, J. A. S	Halifax	Nova Scotia.
*Carlyle, W. L	Chesterville	Dundas, Ont.
†Carpenter, F. C. S	Rat Portage	Rainy River District, Ont.
†Crealy, J. E	Strathroy	Middlesex, Ont.
†Day, G. E	Guelph	Wellington, Ont.
†Dyer, W. D	Columbus	Ontario, Ont.
†Eaton, L. W	Dartmouth	Nova Scotia.
*Gibson, D. Z	Willow Grove	Haldimand, Ont.
†Graham, W. R	Belleville	Hastings, Ont.
Haight, W. L	Wellington	Prince Edward, Ont.
†Harcourt, R	St. Anne's	Lincoln, Ont.
*Harrison, F. C	Ronda	Spain.
*Hutchinson, J. W	Randolph	Wisconsin, U.S.A.
*Marsh, G. F	Thornbury	Grey, Ont.
*Morgan, R. N	Kerwood	Middlesex, Ont.
*Newcomen, W. F	Epping	Essex, England.
Roper-Curzon, A	Kingston	England.
†Roper-Curzon, S	Kingston	England.
†Shaw, R. S	Guelph	Wellington, Ont.
†Soule, A. McNairn	Southend	Welland, Ont.
Sparrow, J. C. H	Antrim	Carleton, Ont.
†Story, H	Picton	Prince Edward, Ont.

Second Year Students.

Atkinson, James	Seaforth	Huron, Ont.
Brooks, W. C	Brantford	Brant, Ont.
Brown, B. C	Kingston	Frontenac, Ont.
Brown, W. J	Dunboyne	Elgin, Ont.
Burns, J. H	Kirkton	Perth, Ont.
Carlaw, W	Warkworth	Northumberland, Ont.
Conn, J	Heathcote	Grey, Ont.
Cooper, W. W	Kippen	Huron, Ont.
Dean, F	Harley	Brant, Ont.
Elmes, W. A	Princeton	Brant, Ont.
Ferguson, J. J	Smith's Falls	Leeds, Ont.
Findlay, J. H	Barrie	Simcoe, Ont.
Freeman, G. M	Boxgrove	York, Ont.
Gies, N	St. Jacob's	Waterloo, Ont.
Hamilton, C. A. W	Alcester	Warwickshire, England.
Harvey, T. B	Charing Cross	Kent, Ont.
Harvey, W. H	Exeter	Huron, Ont.
Hay, L	Ruda Guzowska	Poland.

* Obtained the degree of B.S.A. in June. † Received an Associate Diploma in June.

Second Year Students.—Concluded.

Name.	P. O. Address.	County, etc.
Honsberger, J. D.	Jordan Station	Lincoln, Ont.
Hunter, H. A	Orangeville	Dufferin, Ont.
Hurley, T. J	Belleville	Hastings, Ont.
Husband, E. M.	Cairngorm	Middlesex, Ont.
Kennedy, P. B.	Sarnia	Lambton, Ont.
Kent, A. L.	Toronto	York, Ont.
Lehmann, R. A	Orillia	Simcoe, Ont.
Moody, A. A.	Guelph	Wellington, Ont.
McCallum, Wm	Guelph	Wellington, Ont.
McCrimmon, W. D	Glen Roy	Glengarry, Ont.
McKenzie, W. G.	Fairview	Oxford, Ont.
Maclean, R. R.	Stanley House	Parry Sound District, Ont.
McMordie, R	Kippen	Huron, Ont.
McNaughton, K.	Walkerton	Bruce, Ont.
Phin, A. E.	Hespeler	Waterloo, Ont.
Ruthven, W. A	West Essa	Simcoe, Ont.
Spencer, J. B.	Brooklin	Ontario, Ont.
Stewart, J.	Snake River	Renfrew, Ont.
Tolton, J. E	Walkerton	Bruce, Ont.
Walker, F.	Norwich	Oxford, Ont.
Wiancko, A. T.	Sparrow Lake	Muskoka, Ont.
Yuill, A. R	Carleton Place	Lanark, Ont.

First Year Students.

Ainley, W.	Barrie	Simcoe, Ont.
Atkinson, John	Seaforth	Huron, Ont.
Aveline, R.	Wrington	Somerset, England.
Baird, W. H.	Weir	Wentworth, Ont.
Barr, D. M.	Douglas	Renfrew, Ont.
Bealy, H. B.	Ratcliffe Close	England.
Black, Hugh	Scotch Block	Halton, Ont.
Brent, A. H.	Tyrone	Durham, Ont.
Brown, Robert	Hermitage	Dalbeattie, Scotland.
Buchanan, John	Hensall	Huron, Ont.
Burdett, A. H.	Hallatrow	North Bristol, England.
Butler, E	Dereham Centre	Oxford, Ont.
Caldecott, F.	Toronto	York, Ont.
Carrick, C.	Kincardine	Huron, Ont.
Christian, A. H	Danforth	York, Ont.
Clunn, W. P	Penarth	South Wales.
Connor, George	Chiselhurst	Huron, Ont.
Cook, J. H.	Gordonville	Wellington, Ont.
Counsell, W. N.	Hamilton	Wentworth, Ont.
DeHart, E. F. R	Whitby	Ontario, Ont.
Day, A. H.	Guelph	Wellington, Ont.
Doherty, W. M	Eglinton	York, Ont.
Elford, F. C.	Holmesville	Huron, Ont.
Elliott, Wm	Galt	Waterloo, Ont.
Elmes, J. H	Princeton	Brant, Ont.
Emigh, C. G	Holbrook	Oxford, Ont.
Farrer, J. W.	Parry Sound	Parry Sound, Ont.
Ferraby, E. L.	Cottingham	Yorkshire, England.
Fee, F. W.	Toronto	York, Ont.
Fitzgerald, J. P.	Mt. St. Louis	Simcoe, Ont.

First Year Students.—Concluded.

Name.	P. O. Address.	County, etc,
Garbutt, R. A	Peterborough	Peterborough, Ont.
Gilleland, H. C.	St. Catharines	Lincoln, Ont.
Graesser, F. A.	Llangollen	North Wales,
Grantham, H. V	Mohawk	Brant, Ont.
Gray, F. W	Delhi	India.
Hallett, F. T.	Weymouth	Dorset, England.
High, A	Beamsville	Lincoln, Ont.
Henderson, R	Rockton	Wentworth, Ont.
Heward, A. D.	Toronto	York, Ont
Holmes, C. U	Selkirk	Haldimand, Ont.
Hunter, H. E	Pembroke	Renfrew, Ont.
Jackson, T. M.	Victoria	British Columbia.
James, D. A	Nilestown	Middlesex, Ont.
Jardine, J. E. A	Prince Albert	Northwest Territory.
Kennedy, W. A	Apple Hill	Glengarry, Ont.
Kerr, W. C	Pembroke	Renfrew, Ont.
Kidd, D. F.	Cookstown	Simcoe, Ont.
King, W. A	Decewsville	Haldimand, Ont.
Kirk, Hugh	Kirkton	Huron, Ont.
Lailey, F. T	Toronto	York, Ont.
Logie, A	Grantley	Dundas, Ont.
Mey, W. B.	Leipsic	Germany.
Miller, R. C	Burlington	Halton, Ont.
Millson, A	Solina	Durham, Ont.
Mitchell, S.	Brampton	Peel, Ont.
McCullough, H. A	Nantye	Simcoe, Ont.
McDonald, F. J.	Tracadie	Prince Edward Island.
McDonald, W. A.	Tracadie	Prince Edward Island.
McDonald, N	Russell	Russell, Ont.
McDonald, R	Alexandria	Glengarry, Ont.
Macfie, C. M.	Appin	Middlesex, Ont.
McKay, W. E	Prince Albert	Northwest Territory.
McKenzie, R. V	Lucknow	Bruce, Ont.
Nelles, N. C. S	Grimsby	Lincoln, Ont.
Newman, W. M.	Gilbert's Mills	Prince Edward, Ont.
Payne, G. Y	Peterborough	Peterborough, Ont.
Pettit, F. E	Burgessville	Oxford, Ont.
Phin, George	Hespeler	Waterloo, Ont.
Rathwell, W	Ferguson's Falls	Lanark, Ont.
Reinke, C. E.	Ancaster	Wentworth, Ont.
Rice, T. L	Toronto	York, Ont.
Robertson, G. A.	Kingston	Frontenac, Ont.
Robertson, Wm	Meaford	Grey, Ont.
Ross, T. E	Barrie	Simcoe, Ont.
Rowe, G. F	East Dulwich	London, England.
Shorey, S. C.	Harrowsmith	Addington, Ont.
Simpson, A. E	Hamilton	Prince Edward Island.
Smyth, F. L	Tormore	York, Ont.
Thompson, W. J	Edgar	Simcoe, Ont.
Thompson, J. A.	Thornton	Simcoe, Ont.
Traviss, C. H.	Holt	York, Ont.
Vannater, P. O.	Ballinafard	Wellington, Ont.
Vipond, J. M	Donegal	Perth, Ont.
Wait, J. W	St. George	Brant, Ont.
Watson, H.	Brampton	Peel, Ont.
Webster, C. L.	Lutherville	Leeds, Ont.
Werry, M. J	Tyrone	Durham, Ont.
Westover, M.	Frelighsburg	Province Quebec.
Wheatley, J	Blackwell	Lambton, Ont.
Widdifield, J. W.	Siloam	Ontario, Ont.
Wilson, E. E.	Brampton	Peel, Ont.
Wilson, G. H.	Toronto	York, Ont.
Wood, R. S	Walton-on-Thames	Surrey, England.
Woolley, D.	Simcoe	Norfolk, Ont.

APPENDIX II.

SYLLABUS OF LECTURES.

Lectures began as usual on the 1st October, 1891, and continued with the omission of the Christmas vacation, until the 30th June, 1892, which latter date was the end of the scholastic year 1891-92.

The following syllabus of lectures will convey some idea of the class-room work done by the several Professors in the nine months just mentioned :

FIRST YEAR.

Fall Term.—1st October to 22nd December.

Agriculture.

Introductory.—Ancient and modern agriculture ; agricultural literature ; different systems of farming ; history of agriculture.

Soils.—Their formation and composition, physical and chemical properties, etc. ; examination and classification of soils ; cultivation of soils, including various tillage operations—plowing, harrowing, cultivating, rolling, etc.

Land Drainage.—Method of laying out drains ; various kinds of drains and their construction ; different modes of draining.

Rotation of Crops.—Importance and necessity of rotation ; principles underlying it ; rotations suitable to different kinds of soil ; examination and criticism of different systems of rotation.

Cattle.—Pointing out and naming the different parts of the animal ; characteristic points and peculiarities of the principal beef and dairy breeds of cattle ; practical handling of beef and dairy animals.

Natural Science.

Chemical Physics.—Matter ; accessory and essential properties of matter ; attraction ; various kinds of attraction—cohesion, adhesion, capillary, electrical and chemical ; specific gravity ; weights and measures ; heat, measurement of heat, thermometers, specific and latent heat ; sources, natures and laws of light.

Inorganic Chemistry.—Scope of subject ; elementary and compound substances ; chemical affinity ; symbols ; nomenclature ; combining proportions by weight and by volume ; atomic theory ; atomicity and basicity ; oxygen and hydrogen ; water—its nature, functions, decomposition and impurities ; nitrogen ; the atmosphere—its composition, uses and impurities ; ammonia—its sources and uses ; nitric acid and its connection with plants.

Human Physiology and Hygiene.—Description of the different tissues of the body ; alimentary system ; circulatory system ; nervous system ; importance of ventilation and the influence of food on the body ; remarks on the proper care of the body and attention to its surroundings in order to keep it in a continual state of health.

Zoology.—Distinction between animate and inanimate objects; distinction between plants and animals; basis of classification of animals; leading character of each sub-kingdom, with special reference to classes of animals connected with agriculture.

Veterinary Science.

Anatomy and Physiology of the horse, ox, sheep and pig; osseous system, muscular system, syndesmology, plantar system and odontology.

English.

Composition.—Review of Grammar, with exercises on capital letters and punctuation.
Literature.—Selections from Tennyson.

Mathematics.

Arithmetic.—Review of subject, with special reference to farm accounts. Interest, discount, stocks, and partnership.
Mental Arithmetic.—Calculations in simple rules.
Book-keeping.—Subject commenced.

Winter Term.—22nd January to 16th April.

Agriculture.

Manures.—Composition, management, and application of farmyard manure; artificial fertilizers—their composition, uses, and modes a application; mechanical and chemical effects of manures on various kinds of soil and crops; the amounts to apply, etc.; green manures.

Crops for Soiling.—The advantages of soiling; the principal soiling crops; feeding of green crops to live stock.

The Weeds of the Farm.—The most troublesome weeds described, and different modes of eradicating them.

Sheep.—Characteristic points of medium and long wool breeds, and practical handling of same.

Natural Science.

Inorganic Chemistry (Continued).—Carbon; combustion; carbonic acid and its relation to the animal and vegetable kingdom; sulphur and its compounds; manufacture and uses of sulphuric acid; phosphorus; phosphoric acid and its importance in agriculture; chlorine—its bleaching properties; bromine; iodine; silicon; potassium; calcium; magnesium; iron, etc.

Organic Chemistry.—Constitutions of organic compounds; alcohols; aldehydes, acids and their derivatives; formic, acetic, oxalic, tartaric, citric, lactic, malic, uric, and tannic acids. Constitution of oils and fats—saponification; sugars, starch, cellulose; albuminoids, or flesh formers, and their allies; essential oils; alkaloids—morphine and quinine; classification of organic compounds.

Zoology (Continued).—Sub-kingdoms further described; detailed account of some injurious parasites, such as "liver-fluke," "tape-worm," "trichina," etc.; insects—their influence on plant life; corals and mollusks as agents in the formation of soil; vertebrates, with special reference to those of importance in the economy of the farm.

Lectures illustrated by specimens and diagrams.

Veterinary Science.

Veterinary Anatomy.—Anatomy and physiology of the horse, ox, sheep and pig—digestive system, circulatory system, respiratory system, urinary system, nervous system, sensitive system, generative system, tegumental system.

English.

Composition.—Exercises continued; letter writing, etc.
English Classics.—Critical study of selections from Tennyson.

Mathematics and Book-keeping.

Arithmetic.—Equation of payments; percentage; profit and loss; stocks; partnership; exchange.
Book-keeping.—Business forms and correspondence; general farm accounts; dairy, field, and garden accounts.

Spring Term.—17th April to 30th June.

Agriculture.

Preparation of Soil.—Modes of preparation for different crops, and various kinds of soil.
Seeds and Sowing.—Testing the qality of seed; changing seed; quantity per acre; and methods of sowing.
The Crops of the Farm.—Their growth and management—hay, rye, wheat, barley, oats, peas, buckwheat, potatoes, turnips, mangels, sugar beets, rape, etc.
Pastures.—Growth and management of pastures; temporory and permanent pastures.
Feeding of Live Stock.—General outline of the principles of feeding different kinds of stock.

Natural Science.

Geology.—Connection between geology and agriculture; classification of rocks—their origin and mode of formation, changes which they have undergone after decomposition; fossils—their origin and importance; geological periods and characteristics of each.

Geology of Canada, with special reference to the nature and economic value of the rock deposits; glacial period and its influence on the formation of soil.

Lectures illustrated by numerous specimens and designs.

Botany.—Full description of seed, roots, stem, leaves, and flower. Plants brought into the lecture-room and analyzed before the class, so as to render students familiar with the different organs and their use in the plant economy.

Lectures illustrated by excellent diagrams.

Veterinary Science.

Materia Medica.—The preparation, doses, action, and use of about one hundred of the principal medicines used in veterinary practice.

English

English Grammar and Composition.—Authorized Grammar.
English Classics.—Critical study of selections from Wordsworth.

MATHEMATICS.

Mensuration.—Mensuration of surfaces—the square, rectangle, triangle, trapezoid, regular polygon, circle. Special application to the measurement of lumber. Mensuration of solids; special application to the measurement of timber, earth, etc.

Fall Term—1st October to 22nd December.

AGRICULTURE.

Cattle.—Origin and history of the leading breeds of cattle in America; beef breeds—their leading characteristics and principal points: dairy breeds—their leading characteristics and principal points; practical handling and judging of cattle.

NATURAL SCIENCE.

Agricultural Chemistry.—Connection between chemistry and agriculture; the various compounds which enter into the compositions of the bodies of animals; the chemical changes which food undergoes during digestion; chemical changes which occur during the decomposition of the bodies of animals at death; the functions of animals and plants contrasted; food of plants, and whence derived; origin and nature of soils; classification of soils; causes of unproductiveness in soil and how detected; preservation, improvement and renovation of soils; manures classified; the chemical action of manures on different soils; commercial valuation of fertilizers.

Horticulture.—Ontario as a fruit-growing country; the natural divisions into which it may be divided for growing fruit; detailed account of the operations, layering, grafting, budding pruning, etc.; laying out and cultivation of an orchard; list of fruits best suited for general purposes, with best methods for their cultivation; remarks on gardening as a source of profit; plants best adapted to bedding and potting.

Lectures illustrated by practical work in the garden, and specimens in the class-room.

VETERINARY SCIENCE.

Pathology.—Osseous System.—Nature, causes, symptoms and treatment of diseases of bone, as splint, spavin, ringbone, etc.

Muscular System.—Nature, causes, and treatment of flesh-wounds, etc.

Syndesmology.—Nature, causes, symptoms and treatment of curb, bog-spavin and other diseases of the joints.

Plantar System.—Nature, causes, symptoms and treatment of corns, sand-crack, founder and other diseases of the feet.

Odontology.—Diseases of the teeth, and treatment of the same.

ENGLISH.

English Classics.—Critical study of Shakespeare's "Julius Cæsar."

MATHEMATICS.

Dynamics—Motion, forces producing motion, momentum; work, the simple machines, etc.

Winter Term—22nd January to 16th April.

Agriculture.

Sheep.—Origin and history of the leading breeds of sheep in Britain and America; coarse, medium and fine wooled sheep—their leading characteristics and principal points; practical handling and judging of sheep.

Swine.—Origin and history of the leading breeds of swine in Britain and America; large and small breeds of swine—their leading characteristics and principal points; practical handling and judging of swine.

Natural Science.

Agricultural Chemistry.—Continuation of the subject from preceding term, as follows: Composition of plants in relation to the soils upon which they grow; rotation of crops; the classification of fodders according to their chemical composition and a general treatment of the science of cattle feeding; relation of feeding to manure; chemistry of the dairy.

Entomology.—Importance of the subject to agriculturists; beneficial and injurious insects—their habits and the best means of checking the ravages of the latter.

Lectures illustrated by specimens.

Meteorology.—Relation of meteorology to agriculture; composition and movements of the atmosphere; description of the barometer; different kinds of thermometers; pluviameter and anemometer, and how to read them; temperature, its influence on agriculture; the elements which are to be considered in the discussion of climate; the principles considered in forecasting the weather.

Lectures illustrated by instruments referred to.

Veterinary Science.

Digestive System.—Nature, causes, symptoms and treatment of spasmodic and flatulent colic, inflammation of the bowels, acute indigestion, tympanitis in cattle, impaction of the rumen, and many other common diseases.

Circulating System.—Description of the diseases of the heart and blood.

Respiratory System.—Nature, causes, symptoms, and treatment of catarrh, nasal-gleet, roaring, bronchitis, pleurisy, and inflammation of the lungs, etc.

Urinary System.—Nature, causes, symptoms and treatment of inflammation of the kidneys, etc.

Nervous System.—Nature, causes, symptoms, and treatment of lock-jaw, string-halt, etc.

Sensitive System.—Nature, causes, symptoms, and treatment of the diseases of the eye and ear.

Generative System.—Nature, causes, symptoms, and treatment of abortion, milk fever, etc.

Tegumental System.—Nature, causes, symptoms, and treament of scratches, sallenders, mallenders, parasites, and other diseases of the skin.

English Literature and Political Economy.

English Classics.—The critical study of Shakespeare's "Hamlet."

Political Economy.—Utilty; production of wealth—land, labor, capital; division of labor; distribution of wealth; wages; trades unions; co-operation; money; credit credit cycles; functions of government; taxation, etc.

Mathematics.

Statics.—Theory of equilibrium ; composition and resolution of forces ; parallelogram of forces ; moments ; centre of gravity, etc.

Hydrostatics.—Transmission of pressure ; the hydraulic press ; specific gravity ; density ; pumps, siphons, etc.

Book-keeping.—Review of previous work.

Spring Term—17th April to 30th June.

Agriculture.

Breeding.—Outline of the general principles of breeding.

Feeding.—Feeding standards ; feeding for growth, meat, milk, quality of milk, etc.

Care and management of cattle, sheep and swine ; care at different periods of growth, at different seasons, and under-varying conditions.

Natural Science.

Determinations of soils and fertilizers by physical properties.

Analytical Chemistry.—Chemical manipulation, preparation of common gases and reagents ; operations and analysis—solution, filtration, precipitation, evaporation, distillation, sublimation, ignition and the use of the blow-pipe ; testing of substances by reagents ; impurities in water ; adulterations in foods and artificial manures ; injurious substancss in soils.

Systematic and Economic Botany.—Classification of plants and characters of the most important orders.

This course is illustrated by a large collection of plants in the college herbarium, and also by analysis of several plants collected in the fields and woods of the farm.

Green-house Plants.—Special study of all plants grown in our green-houses, and the shrubs, etc., on the lawn.

Veterinary Science.

Materia Medica.—The preparation, actions, uses, and doses of medicines—continued from the spring term of the first year. Lectures on special subjects, such as pleuro-pneumonia, the rinderpest, tuberculosis, etc.

Veterinary Obstetrics.—Description of fœtal coverings. Pneumonia in connection with puberty, œsirom, gestation, sterility, abortion, normal and abnormal parturition. Diseases incidental to pregnant and parturient animals.

English.

English Classics.—The critical study of Milton's " L'Allegro " and " Il Penseroso."

Mathematics.

Surveying and Levelling.—Fields surveyed with chain and cross-staff ; measurements of heights.

Road-making.—Determination of proper slopes ; shape of road bed ; drainage of roads ; friction on different roads ; various road coverings ; the maintenance of roads ; cost, etc.

THIRD YEAR.

Fixed Work.

Chemistry.—The work in this department comes under four heads, each of which forms the basis of a separate examination :

General Chemistry, Organic and Inorganic.—Roscoe's "Lessons in Elementary Chemistry" (1886 edition), with a course of lectures. Most stress laid on those elements and compounds which have an agricultural bearing ; laws and theories of chemistry discussed.

Agricultural Chemistry.—"Chemistry of the Farm" (Warington), and "Agriculture in some of its Relations with Chemistry" (Storer), with lectures, Vol. I, Chapters, 1, 2, 3, 4, 7, 8, 9, 10, 11 and 12 ; Vol. II, Chapters, 5, 6, 7, 8, 9, 10, 15, 17, 18 and 19.

Animal Chemistry and Cattle Feeding.—"Manual of Cattle Feeding" (Armsby), with lectures.

Analytical Chemistry.—Qualitative and Quantitative Analysis of soils, fertilizers, agricultural products, etc.

Natural History.—Four Examinations, as follows :

Zoology.—Differences between plants and animals ; parasitic animals, especially those injurious to farm animals ; animals which have assisted in the formation of soil ; insectivorous birds, etc.

Economic Entomology.—Classification of insects ; characters of orders into which insects are divided ; 75 insects injurious to vegetation, and the best means of destroying them ; insecticides—their uses and modes of application.

Structural and Physiological Botany.—Cells and tissues of plants ; reproduction, assimilation, absorption, and metabolism of plants ; processess of fertilization and hybridization ; plants in relation to soil ; classification of plants and study of the most important orders ; analysis of plants ; examination of specimens in herbarium, and illustrations by magic lantern.

Economic Botany.—Special reference to injurious fungi and weeds.

Microscopy.—Manipulation of microscope ; methods of mounting specimens ; drawing and measuring objects under microscope ; microscopic study of the structure of plants and other objects. Hillhouse pp. 1-35, and appendix IV.

Drawing.—Freehand and mechanical drawing, especially the drawing and construction of farm houses, barns, stables, etc.,—ground plans, elevations, sections, and construction.

English.—(1) Grammar (High School Grammar). (2) Composition and Rhetoric (Bain). (3) Outlines of English Literature (Lectures with Spalding and Craik. (4) Themes. (5) Critical reading of the following selections :

Shakespeare—Richard II.

Bacon—Essays : Of Studies, Great Place, Boldness, Goodness and Goodness of Nature, Youth and Age, Discourse, Friendship.

Milton—Lycidas and Paradise Lost, Bk 1.

Pope—Essay on Criticism.

Addison—Spectator, Nos. 23, 26, 47, 93, 115, 162, 225, 381, 387, 483, 583, 598.

Wordsworth—The Solitary Reaper ; Intimations of Immortality ; Resolution and Independence.

Macaulay—Essay on Lord Bacon.

DeQuincey—William Wordsworth.

Tennyson—Locksley Hall ; In Memoriam, i-xxvii.

Note—In order to pass this department, it is necessary, above everything else, that the candidate know how to spell correctly and be able to write good English.

OPTIONS.

Three of the the following subjects must also be taken, in addition to the fixed work prescribed above.

1. *Agriculture.*—(1) Principles and practice of general agriculture ; "Agriculture in some of its relations with Chemistry" (Storer), Vol. I., Chapters 5, 6, 13, 14, 15, 16, 18, and Vol. II., Chapters 1, 2, 3, 4, 11, 12, 13, 14, 16, 20, 21, 22 ; (2) Characteristic points of the most valuable breeds of horses, cattle, sheep, and pigs ; "History of Polled Aberdeen or Angus Cattle" (Macdonald and Sinclair), Chapters I—V ; "History of Hereford Cattle" (Macdonald and Sinclair), Chapters I and X ; (3) Construction and arrangment of farm buildings with a view of cheapness, economy of space, and convenience.

2. *Darying.*—(1) "Dairy Farming" (Sheldon), Chapters 1-6, 11-15, 19, 33, 34 ; (2) "American Dairying" (Arnold) ; (3) "Scientific Dairy Practice" (Lynch) ; (4) Milch Cows" (Flint) ; (5) "Dairyman's Manual" (Stewart) ; (6) "Reports of Dairy Associations of Ontario," 1887, pp. 21-63, 66-68, 99-107, 125-146, 156-174, 177-205, 213-249 ; 1888, pp. 7-11, 15-17, 21-24, 51-59, 114-128, 143-156, also subsequent reports to date ; (6) "Analysis of Foods" (Blyth), pp. 194-218, 228-246, 251-280, 283-293, 305-313.

3. *Geology.*—A general review of the subjects ; special reference to the various systems and formations found in Canada, particularly the Geology of Ontario, New Brunswick, Nova Scotia, Manitoba and the Northwest ; economic products in Canadian rocks ; chief agents in the disintegration of rocks ; a thorough study of the origin and formation of soil.

4. *Algebra.*—Through quadratic equations.

5. *Euclid.*—Books I and II, with simple deductions.

6. *Latin.*—Principia Latina, part I, I—XXXIII, with a view to learn the pronunciation of scientific terms, and those Latin roots from which a large number of English words are derived.

Books of Reference in Botany, etc.—Entomology (Comstock) ; Injurious Insects (Saunders) ; Bound Reports Entomological Society ; Structural Botany (Gray), Physiological (Vines) ; Systematic (Gray's Manual and Spotton, part II.) ; Injurious Fungi (Smith) ; Weeds (Stock Journal '88) ; Practical Botany (Hillhouse) ; Microscope (Phin) ; Microscope and Botany (Behrens).

APPENDIX III.

I.—PAPERS SET AT EASTER EXAMINATIONS, 1892.

FIRST YEAR.

Agriculture.

I. How may undue fermentation in farmyard manure be checked? Are moderate and frequent dressings preferable to heavy dressing at long intervals? If so, give the reasons.

II. Why are bones valuable as a fertilizer? In which forms are they chiefly used as manures? What effect has grinding upon their action?

III. State some general principles that govern the wise application of fertilizers.

IV. Show how a judicious rotation of crops is economical of manure; how it improves the texture of the soil. State a rotation suitable for sandy loams.

V. How does soiling affect the quality of the manure? the health and condition of the animals? What value do you place upon lucerne as a soiling crop?

VI. Where should wheat be placed in the rotation? State the preparation of soil required.

VII. State the amount of seed required in sowing rye. Wherein consists the value of the straw? How may it be separated from wheat?

VIII. State the leading facts relating to the introduction of the turnip into Britain. What were the effects upon the agriculture of that country?

IX. Describe the cultivation required in growing rape, including the preparation of the soil before sowing?

X. State the principal uses of the common red clover (*Trefolium pratense*) and the amount of seed required per acre. Give notes bearing on the growth of common yellow clover (*Medicago lupulina*)?

Inorganic Chemistry.

I. What is meant by chemical action? "The numerous cases of chemical action may be divided into three classes"; name them, and give examples.

II. Name the products formed in the following: Sulphur burned in oxygen; phosphorus burned in the air; hydrogen burned in the air, and also in chlorine.

III. A large quantity of hydrogen gas is required. Sketch apparatus, and describe the method of preparation you would adopt. What weight of pure zinc (At. Wt. 56) will be required to make three litres of hydrogen collected under the normal conditions of temperature and pressure?

IV. Name the substances represented by the following formulas:—H^2O^2, HClO, $H_4P_2O_7$, P_2O_5, As_2O_3, AlK $(SO_4)_2$, Hg^2Cl^2, and H_2SO_3.

V. Explain the action of hydroxides of calcium, potassium or sodium on salts of ammonia.

VI. Define an acid, a base, an acid salt, a non-metal, and a dibasic acid.

VII. Show, by chemical equations, the action of sulphuric acid on calcium phosphate in the preparation of mono-calcic, di-calcic, and tri-calcic phosphates.

VIII. Write formulas for the following: Soda, Chili saltpetre, Glauber's salt, sal-ammoniac, gypsum, bleaching-powder, superphosphate of lime, and kaolin.

Organic Chemistry.

I. Define the terms hydrocarbon and carbohydrate. Give a classification of the carbohydrates.

II. Represent graphically the relation between the members of the marsh gas series.

III. Give the formulas for ethane, ethyl alcohol, ethyl-methyl ether, acetic aldehyde, and acetic acid.

IV. Write the graphic formulas for the hydroxyl derivatives of butane and isobutane.

V. Give the characteristic groups of the following: Primary alcohol, aldehydes, monobasic acids, and ketones.

VI. Define an etheral salt, giving the names and formulas of three contained in animal fat.

VII. Distinguish between secondary and tertiary alcohols.

VIII. Name the acids of the ethereal salts of butter.

Zoology.

I. Compare the circulatory apparatus of an insect with that of a bird.

II. Name three classes of animals that have exerted an influence upon the composition of soil and the sub-kingdoms to which they belong.

III. From what sources are the following obtained: Spermaceti, pearls, amber, sponges, and ivory?

IV. Describe fully the life history of trichina spiralis, with special reference to its occurrence and influence upon man.

V. Give four marked differences between animals and plants.

VI. Give a list of injurious birds, and state in what way they may be termed such.

VII. To what orders and sub-kingdoms do the following belong: dolphin, hydra, egret, salmon, amœba, sheep, swan, liverfluke, sea-mat, snail?

VIII. Explain the terms, parasite, hybernate, mimicry, metamorphosis and symbiosis, giving the name of sub-kingdoms containing animals which illustrate them.

IX. Identify the specimens before you.

Veterinary Anatomy.

I. State the functions of voluntary muscles, and explain how they are made up.

II. Give the functions of the abdominal muscles and diaphragm.

III. Where is the mucous membrane found?

IV. What are glands?

V. In what respect do the teeth of herbivora, carnivora, and omnivora differ in form?

VI. How is the process of chylification affected, and what becomes of the chyle?

VII. Name the respiratory organs, and describe the trochea, bronchi, and bronchial tubes.

VIII. Describe a malpighian body of the kidneys, and the course the urine pursues from its point of secretion to its point of excretion.

IX. Describe the uterus.

X. Describe the course of the semen from its point of secretion to its reservoir.

English Grammar and Composition.

I. Explain and illustrate what is meant by the terms *Nominative case, Objective case, Possessive case.*

II. Quote rules and exceptions, with an example of each, for the formation of the plural of nouns and pronouns in English.

III. Analyse the following passage :

" But if the compound consists of a noun, followed by an adjective word or phrase, the noun part alone takes the plural."

IV. Correct the following sentences where necessary, giving the reason for each change you make :

(1) Will I bring your glasses ?
(2) They have laid here since morning.
(3) We merely refer to the order of the words.
(4) Please hand me them books.
(5) Can I have it after you are done with it ?
(6) A brave prudent honorable man was chosen.
(7) Don't buy any more of those sort of pencils.
(8) Six month's interest was due on the note.

V. Quote the rules for the use of the semi-colon and the dash.

(*a*) Punctuate the following sentences :

(1) Henry F Bond junior LLD
(2) This is the question whether it is expedient to purchase temporal pleasure at the expense of eternal happiness.
(3) This is the question Is it expedient to purchase temporal pleasure at the expense of eternal happiness.
(4) Mirth shd. be the embroidery of conversation not the web and wit the ornament of the mind not the furniture.

VI. Write a short friendship letter, paying strict attention to the matter, the form, and the punctuation.

Literature.—" Selections from Tennyson."

I. " The poem ' Ulysses ' affords a study of a character modified or developed by the force of peculiar circumstances."
Enlarge on the above statement. What ' circumstances ' are referred to ? Who was Ulysses ?

II. Explain the phrases :

(*a*) " .....sitting well in order smite "
" The sounding furrows :..... "
(*b*) " One equal temper of heroic hearts "
(*c*) " Lies the warrior, my forefather, with his feet upon the hound"
" Crossed ! "
(*d*) " .....since our dying race began,"
" Ever, ever and forever was the leading light of man."
(*e*) " ..... for man can half control his doom."

III. What is " Poetic license ? " Describe any examples in these poems.

IV. Quote not less than eight consecutive lines from " The Revenge."
Briefly describe the character assigned to Sir Richard Grenville in this poem. Support your description by quotations, if you can.

V. Write explanatory notes on " The Holy Grail." Why is Sir Galahad called " just and faithful knight of God ? "

VI. Explain :

(*a*) .....Freedom slowly broadens down,
From precedent to precedent."
(*b*) " When single thought is civil crime."
Where did Tennyson obtain the material for the poems ?
" You ask me why " and " Of old sat Freedom ? "

VII. Quote a stanza (four lines) from "The May Queen."

VIII. Narrate briefly (in correct English) the story of Emmie, from "In the Children's Hospital."

State any objections you think may be urged against the beauty of this poem.

Arithmetic.

I. Find the profit or loss from feeding 10 steers for one month (30 days) from the following date:

Daily ration: ensilage 40 lb., worth $3.50 a ton; cut hat 10 lb., $10.50 a ton; meal 10 lb,, composed of peas 4 lb., 40c. a bushel; barley 2 lb., 50c. a bushel; oats 2 lb., 38c. a bushel; bran 2 lb., $12 a ton.

Daily increase in weight $1\frac{3}{4}$ lb. (sells for $5.87 a lb.;) manure, 90 lb. a day, worth $1.50 per ton.

II. A mow of hay contains $2\frac{1}{2}$ tons. Out of this, 7 horses are fed 12 pounds each daily for 3 weeks. Find the quantity left and its value at $12 a ton.

III. Add $\frac{1}{2}$, $\frac{5}{6}$, $2\frac{3}{4}$, and $3\frac{}{10}$; divide the sum by $3\frac{1}{2}$, and subtract the quotient from 7.

IV. Multiply 340.07 by 71,001; add 11.1 to the product; and divide the sum by 1.1.

V. Find the simple interest on $545.50 for 1 year 6 months at 6 per cent. per annum.

VI. A sends B wheat which he sells for $1,000 on a commission of 2 per cent. B invests the proceeds in goods for A, after deducting his commission for buying at 3 per cent. Find the value of goods bought.

VII. $1,860 GUELPH, April 11th, 1892.

Three months after date, I promise to pay J. Smith or order, the sum of eighteen hundred and sixty dollars, value received.

R. JONES.

(*a*) If this note is discounted at the Bank of Commerce May 2nd at 7 per cent, find the discount.

(*b*) If the note bears interest at the rate of 10 per cent per annum, find the discount; also find, to two decimal places, the rate per cent. of interest the banker receives for his money.

SECOND YEAR.

Agriculture.

I. Wherein consists the value of a standard scale of points? In the standard for Guernsey cattle, how many points of the scale of 100 relate to the milking qualities? Under what general headings are the remaining points included.

II. State the theories that have been advanced in reference to the origin of our domesticated varieties of sheep. What evidence have we that the improvement received much attention in ancient times?

III. What is meant by *softness* in wool. Mention some influences which affect this property of wool. State the principal defects in wool, and in a general way the means to be used to remedy these.

IV. Give the leading characteristics of the American Merino.

V. Compare the head of the Southdown, Dorset, Hampshire Down, and Oxford Down breeds with that of the Shropshire.

VI. Compare the fleece of the Cotswold, the Lincoln, and the Romney Marsh breeds with that of the Leicester.

VII. Draw a comparison between the Black Faced Highland, Welsh Mountain, and Cheviot breeds, in respect to hardihood, adaptability, mutton producing qualities, and quantity and quality of fleece.

VIII. State the principal points of difference in physical conformation and color between the Duroc-Jerseys, the Improved Yorkshires, and the Chester Whites when compared with the Berkshires.

IX. Give a synopsis of the facts relating to the origin of the Middle Yorkshires. State the leading characteristics of the small Yorkshires.

X. Give in brief and yet in somewhat minute detail what relates to the origin of the Poland China breed of swine.

Practical Cattle.

Time allowed to each student, 12 minutes.

I. Compare the Shorthorn cow "Authoress 16,204," with the Sussex cow "Columbine 7th (4,731") for purposes of beef production.

II. Compare the grade cows Melinda and Matilda for purposes of milk production.

III. Give your opinion of the suitability of the store calf Baalam for purposes of beef production.

Practical Sheep.

Time allowed to each student, 12 minutes.

I. Compare the grade wethers Borderer and Bannerman for mutton purposes; for wool production.

II. Give your opinion of the ewe, E.N. 982, as a representative of the breed as a mutton sheep.

III. Give your opinion of the Oxford Down ram Hero of O.A.C. (850 O.E.F.) as a representative of the breed.

Agricultural Chemistry.

I. Discuss exhaustion of roots and stems of cereal crops during seed formation.

II. Show by chemical equations why alkaline substances, as lime, should not be mixed with ammonium salts, nitrate of soda with damp superphosphate, nor carbonate of lime with superphosphate.

III. State the characteristics in the composition and growth of leguminous crops.

IV. Give the chemical composition of albumnoids, keratin, stearin, and carbohydrates. From what sources are keratin, gelatinoids and animal fat derived.

V. Define protein, nutrient, and animal nutrition.

VI. It is stated that oats contain 12.9 per cent. nitrogenous substance. What are the basis of calculation? What nitrogenous substance does it represent?

VII. Distinguish between heat co-efficient and digestion co-efficient. Give the heat co-efficients of cellulose, starch, fat, and albumin.

VIII. Give the composition of cow's milk. Determine its albuminoid ratio.

IX. Discuss the several fattening periods, with special reference to the statement "after considerable fat has been deposited in the animal, gradually increase the quantity of protein in the food."

Entomology.

I. Give notes on the use of Paris Green as an insecticide, referring to its composition, amount used, method, and time of application.

II. Draw diagrams illustrating typical forms of the hawk moths, saw-flies, and borers, and name the plants affected by them.

III. Give two emulsions, describing how they are made and applied, and name the insects which are destroyed by them.

IV. What plants are usually attacked by the following insects: curculio, army-worm, tussock moth, thrip, cut-worm, chinch bug, canker-worm, rose bug, flea beetle, and Hessian fly.

V. For what insects is carbon disulphide a remedy, and how is it applied? What precautions require to be observed in its use?

VI. By whom and what are the latest results regarding remedies for *Agriotes mancus*?

VII. Give the life history of *Aphis mali* and name other insects of the same order that are injurious.

VIII. Compare London purple and Paris green as insecticides, referring to composition, costs, and results.

IX. Name three injurious insects from each of the following orders: Diptera, hymenoptera, and coleoptera.

Diseases of Domestic Animals.

I. Explain the errors usually committed in shoeing horses.

II. Give the nature, causes, and symptoms of side-bones.

III. What are the differential symptoms of thrush and canker.

IV. Give the nature, symptoms, and treatment of melanotic tumors.

V. Explain the four chief points to be attended to in the treatment of wounds, and name the diseases liable to follow wounds.

VI. Explain the causes of digestive disorders.

VII. Give the symptoms of impaction of the rumen and bloating of cattle.

VIII. Give the treatment of spasmodic and flatulent colic.

IX. Explain the differential symptoms of acute indigestion and enteritis.

X. Give the symptoms and treatment of congestion of the lungs.

Practical Horse.

I. Explain the defects met with in the action of horses.

II. Describe the desirable formation of the middle piece of the horse, and the defects of formation met with in that part.

III. What are the uses of the thermometer? State how to use it, and give the normal temperature of the horses, ox, and sheep.

IV. Explain the advantages and disadvantages of the different methods of administering medicines to animals.

V. Explain how respiration is affected, and the objects of that function.

English Literature—Shakespeare's "Hamlet."

I. Give a general outline of the plot of this play.

II. Why is the monologue used so extensively in this play? Quote a few lines from each of Hamlet's soliloquies in the first four acts,

III. Give a general outline of Hamlet's character, quoting where you can in illustration of your statements, and contrast him with the other young men in the play.

IV. Point out, quoting where you can, where and how in the play the poet satirizes each of the following: Play-actors, affectation in language, court sycophancy, national intemperance, military glory.

V. Trace out and characterize the elements of humor in the play.

VI. In what act, by whom, and under what circumstances, was each of the following often quoted expressions used in the play:

(*a*) "But break my heart for I must hold my tongue."
(*b*) "Something is rotten in the State of Denmark."
(*c*) "Brevity is the soul of wit."
(*d*) "Though this is madness yet there is method in it."
(*e*) "The glass of fashion and the mould of form."
(*f*) "Lay not that flattering unction to thy soul."
(*g*) "There's a divinity that shapes our ends
"Rough-hew them how we will."

VII. Explain and name the speaker of each of the following: "Take each man's censure," "Tickle in the sere," "A vice of kings," "Worse than the mutines in the bilboes." "This quarry cries on havoc."

Political Economy.

N. B.—Candidates are requested not to attempt more than seven questions.

I. What is the problem which Political Economy proposes to solve?

II. What are the forces which lead to the division of labor; and what harmful results have followed its introduction?

III. How does the introduction of labor-saving machinery affect the wage-earner?

IV. What is the fundamental cause of any rent being paid for land, and what is the standard whereby to judge how much rent per annum a particular farm will bring.

V. What rules should be observed in devising a system of national taxation?

VI. Discuss the relative advantages of different kinds of paper currency.

VII. "Wages are increased by increasing the produce of labor." Examine this proposition.

VIII. Estimate the value of co-operation as a means for improving the position of working-men.

IX. "The value of a commodity is in proportion to the amount of labor bestowed on its production." Criticise this doctrine.

II. PAPERS SET AT MIDSUMMER EXAMINATIONS, 1892.

FIRST YEAR.

Agriculture.

I. Give the classification of corn as to varieties, and also its suitability to various soils.

II. Mention the conditions that should govern the planting of corn (1) as to distance (2) as to mode, and (3) as to the amount of seed required.

III. Give your views (1) as to the value of wilting corn after it is cut, (2) of spreading and tramping it in the silo, and (3) of its value as a food factor in making beef.

IV. Describe the common mode of building the wall of a silo from the foundation upwards.

V. Give the leading characteristics of millet.

VI. Would you recommend growing meadow foxtail (*Alopecurus pratensis*), tall oat grass (*Avena elatior*), and meadow fescue (*Festuca pratensis*)? If so, under what conditions?

VII. Name the grasses and clovers suitable to sow in a permanent pasture and the quantities that may be used.

VIII. Describe in detail the mode of destroying the Canada Thistle (*Cnicus arvensis*) by means of growing rye in conjunction with rape.

IX. Give the most effective mode of destroying couch grass (*Triticum repens*).

X. Give a description of Pigeon weed (*Lithospermum arvense*), and name the crops which it more commonly infests.

Dairying.

I. "Farmers must lessen the cost of production." How may this be done in the dairy?

II. Give the requisites of a good dairy cow.

III. How would you proceed to establish a good dairy herd?

IV. State how you would manage a heifer intended for a dairy cow from the time she is dropped until four years old.

V. Explain the secretion or milk, giving an outline of the theories that have been put forth in explanation of the process.

VI. What does ripening cream consist of? Is it necessary for churning?

VII. When and how would you salt butter? How much salt would you add?

VIII. Give a synopsis of "making the butter" in the pamphlet "Good Butter. How to make it".

IX. What are the main features of the Cheddar system of cheesemaking?

X. Give a scale of points for judging Cheddar cheese.

Botany.

I. Describe a seed, and state what conditions are necessary for its germination.

II. Compare the orders Rosaceæ and Leguminosæ, and name three plants in each.

III. Name the different kinds of irregular corrollas, and give examples of each.

IV. How would you proceed to analyze a plant and then identify it?

V. Give notes upon the leaf, and distinguish between an exogenous and endogenous plant.

VI. Draw a diagram illustrating the different forms of roots.

VII. Give examples illustrating how plants store up material for their future use.

VIII. Explain the terms: tetradynamous, syngenesious, perigynous, monadelphous, apetalous, and give examples illustrating each.

Geology.

I. What rocks in Canada give information regarding the composition of the soil in Ontario?

II. Account for the formation of coal, and name the systems in which it is found.

III. Compare the economic products of the Devonian and Triassic systems as regards original. State where these rocks are represented.

IV. Draw diagrams illustrating the terms conformable, fault, cleavage, and denudation.

V. Give the characteristics of the Cretaceous system, and state where it is found.

VI. Name the systems represented in the Province of Ontario.

VII. What forces influence the disintegration of rocks? Give the composition of apatite, gypsum, limestone, dolomite, and granite.

Materia Medica.

I. How do the majority of medicines establish their actions?

II. Define the following terms, and give examples viz., caustic, stomachic, purgative, diaphoretic, diuretic, restorative, sedative, and anæsthetic.

III. Name the different ways in which medicines are given to animals.

IV. Give the capacity of the different domestic utensils, viz., tumblers, tea cups, wine glasses, table-spoons, desert-spoons, amd tea-spoons.

V. Give the properties, actions, and uses of Epsom salts.

VI. Give the uses of the products of flax seed in veterinary patients.

VII. Give a prescription for a tonic for the horse, containing both a mineral and vegetable substance.

VIII. Give the dose of aconite, aloes, Epsom salts, croton oil, and raw linseed oil.

IX. Give the source, properties, actions, and uses of iodine.

X. What are the actions and uses of carbolic acid.

Elementary English Grammar.

I. Make such corrections as you think necessary in the following sentences, giving reasons:

(*a*) He was an independent small farmer.
(*b*) There is a farmer's club in our village.
(*c*) I had not idea but what she'd be here.
(*d*) Let you and I go, Tom and him can stay at home.
(*e*) They have laid here since morning.
(*f*) At what hotel are you stopping?
(*g*) Each of the boys have their books.
(*h*) Give every word and syllable their proper sound.
(*i*) You shouldn't have undertook the business.
(*j*) Those hats didn't ought to be laying there.
(*k*) Raising the window and looking out, busy crowds were seen in the street.
(*l*) Hoping to hear from you, believe me, yours truly.
(*m*) I was present when he done it.
(*n*) That flower is very beautiful and smells so sweetly.

II. Write out a list of auxiliary verbs in English and divide them into two classes.

1. Those which are always used as auxiliaries.
2. Those which are used sometimes as auxiliaries and at other times as principal verbs.

(*a*) State briefly the auxiliary uses of *have* and *be*.

III. Quote rules for the comparison of English adjectives.

IV. Give examples of the different forms of *infinitives* and *participles* found in English; and state how the forms in *ing* can be distinguished from one another.

V. Give the present subjunctive of the verb *to be*.

VI. Explain and illustrate what is meant when we say that "*the verb agrees with its subject in person and number*"; and state what further changes in our language are necessary before we can dispense with this rule.

Literature.—Selections from Wordsworth.

I. Indicate briefly the traits of character of the "Happy Warrior."

II. (*a*) Paraphrase the Ode to Duty.
(*b*) Quote the Ode to Duty.

III. What is the main purpose, or the central thought of each of the following poems, (express this first in your own words, and then, where you can do so, in the poet's words):

(*a*) We are Seven, (*b*) The Fountain, (*c*) The Two April Mornings, (*d*) Expostulation and Reply, (*e*) The Tables Turned.

IV. Narrate the story of Laedameia.

V. Carefully explain (referring to the context) the meaning of the following:

(*a*) . . . her bondage prove
The fetters of a dream, opposed to love.

(*b*) "Ill," said he,
"The end of man's existence I discerned," etc.

(*c*) but lofty thought,
In act embodied, my deliverance wrought.

(*d*) Earth destroys
Those raptures duly, Erebus disdains;
Calm treasures there abide, majestic pains.

(*e*) And many love me, but by none
Am I enough loved.

(*f*) We wear a face of joy because
We have been glad of yore.

VI. In the poem "The Fountain," compare the two readings
"At this he grasped his hands," etc. and
" . . . my hand," etc.
State which you prefer; and show how the slight verbal change makes a considerable change in the character of the old man.

VII. Describe the construction of the sonnet. Give the thought or substance of the sonnet:
"A Poet! he hath put his heart to school."

Mensuration.

I. A field is 210 yds. long and 120 yds. wide.
(*a*) Find the number of acres.
(*b*) Find the area of a circular field with the same perimeter.

II. The diameter of a cistern is 14 ft. Find (*a*) the circumference, (*b*) the number of gallons when the water is 8 ft. deep.

III. A barn is 120 ft. long and 80 wide. If the water from the roof is drained into cistern of question II, find to what depth one inch rainfall will fill the cistern.

IV. A log 5 ft. in diameter is 30 ft. long. Find the cubic feet in the largest squared stick that can be hewn from it.

V. The diameter of the bottom of a pail is 7 inches; the diameter of the top 14 inches; the depth 1 foot; how often can it be filled from a vessel in the form of a frustum of a pyramid on a square base; the edge of base 6 ft., the edge of top 3 ft., and height 5 ft?

VI. Explain by means of examples how to find the height of an object which cannot be climbed, and the breadth of a stream that cannot be crossed, (*a*) using carpenters' tools etc., (*b*) using only measuring line and rods.

Book-keeping.

I. Briefly describe the best system of book-keeping that will give the information, regarding his business that the average Ontario farmer requires.

II. Write the form of a promissory note, of a receipt for wages, of a receipt for rent of an accepted draft.

III. Make out an inventory of implements on a farm of 150 acres.

IV. Make out and close an annual account with cows.

V. How would you enter the following in the ledger:

Mention the name of the account, the side and the amount.

(a) Jan. 10, '91. You buy a cow for $225, giving your note, due six months hence, bearing interest at 8 per cent.
(b) July 12, '91. You pay for the note.
(c) April 5, '91. You sell a horse for $150 cash and a note for $100 due six months hence.
(d) July 10, '91. You get the note discounted at the Bank of Commerce at 7 per cent.
(e) You underdrain Field No. 1, paying for tile and labor $300 cash; value of labor for which no money is paid is $100.
(f) You sow twenty bushels of fall wheat in Field No. 2, for which you pay $1.10 a bushel.
(g) You put 50 loads manure on Field No. 3, worth $1 a load.

SECOND YEAR.

Live Stock and Arboriculture.

I. In breeding, what is meant by the terms "prepotency" and "selection?" What value should be put upon the former, and what are the leading principles which govern the latter?

II. Give the distinctions between a cross-bred, a grade, a high grade and a scrub. Which of these classes of animals, in your opinion, may be most profitably bred by the average Canadian farmer under existing conditions, and give the reasons?

III. Mention the general individual properties to be sought in a dam of the beefing types of cattle, the dairy types, and in the dam of the combined mutton and wool producing sheep.

IV. Mention the rations suitable for calves of the beefing and the dairy breeds, giving prominence to the points of difference.

V. State the winter rations which you consider suitable for store cattle to be finished on the grass the following season, and for beef cattle to be shipped from the stall, giving prominence to the points of difference.

VI. State the leading indications of nerve power, good digestion, and superior milk secretion in a dairy cow, and the special milk indications in a dairy bull.

VII. Give the desirable characteristics as to form in sheep and lambs for fattening.

VIII. Give the chief of the reasons for and against the wholesale removal of forests.

IX. Give the definition for coniferous trees; state some important particulars regarding their growth. Which varieties do you consider the most suitable for windbreaks?

X. In reforesting, where should a regular order be observed, and where is it not necessary? What are the respective advantages of planting in rectangles, in squares, and in the quincunx order? How would you mark out a field for planting in triangles?

Dairying.

I. Review briefly "Scientific Dairy Practice."

II. What are the chief causes of imperfect milk?

III. State the advantages and disadvantages of the centrifuge; give the points of merit in a cream separator.

IV. How would you keep a record of a herd of dairy cows? Is it important to do so?

V. Give the classification of the bacteria of milk according to L. Adametz; state the effects (chemical and physical) produced on milk by each class.

VI. Give a list of utensils required in a cheese factory of 500 to 700 cows capacity.

VII. Explain the theory of cheese-making.

VIII. Determine volumetrically the per cent. of water, fat, solids not fat, and total solids in the sample of milk before you.

IX. Score the samples of butter placed before you.

X. There was delivered at a cheese factory 312,259 lb. milk, from which was made 30,312 lb. cheese. Value of the cheese $2,609.54; cost of manufacturing $363.85.

Of this milk A sent 4,804 lb., testing 3 per cent. fat.
B " 200,000 " $3\frac{1}{2}$ "
C " 107,455 " 4 "

Find the amounts of money which A, B and C are entitled to receive

1. On the the present plan of distributing proceeds at the factory.
2. On the proposed plan according to the fat contents of the milk.

Practical Chemistry.

I. Determine the metal or metals present in the solution given.

II. The precipitated chlorides of Group 1 are washed first with cold and afterwards with warm water. Why?

III. A residue of mercurous and silver chlorides is washed with warm ammonia water; give chemical equations showing its effect upon each chloride.

IV. Name the sulphides of the metals of G. II, S.-G. A, that are soluble in dilute boiling nitric acid.

V. State a method for determining bismuth and cadmium in a nitric acid solution containing in addition lead and copper.

Economic and Systematic Botany.

I. Give an outline of the development of a typical form among the fungi and draw diagrams illustrating the life history of the common rust upon wheat.

II. Give brief notes upon Chlorophyll, Inulin, Lenticels, and "Root pressure."

III. How are cells formed, and name some of the modifications they undergo, giving examples in each case.

IV. Name poisonous plants in the following orders: Leguminosæ, Solanaceæ and Umbelliferæ, and give the characters of the Borraginaceæ with examples of weeds found in it.

V. Compare the orders Labiatæ and Scropulariaceæ, giving examples of weeds from the latter.

VI. Give reasons for believing chess is not deteriorated wheat, and distinguish couch grass from rye grass, and bladder campion from white cockle.

VII. To what orders do the following belong: Chickweed, sow-thistle, artichoke, buckwheat, plum, milkweed, clematis and sorrel.

VIII. In what orders do we find plants of value in the manufacture of cloth, varnish, oil, and for fruit.

IX. Identify the specimens before you, stating where those under the microscopes can be obtained.

Practical Horticulture.

I. Draw a diagram indicating an arrangement of the most common orders among flowering plants for instructive purposes.

II. Compare the following shrubs: Caragana, Spiræa, Weigela, Deutzia, and Forsythia.

III. Arrange the following plants in a rectangular bed: Geranium, cerastium, dahlia, iresine, coleus, and distinguish between carpet and ribbon bedding.

IV. Give the position of the first four trees in an orchard where the trees are planted after the hexagonal form, 35 feet apart.

V. Outline the management of a strawberry bed for three years, and state the varieties you would suggest to plant.

VI. Describe the weather and state of vegetation during the first week in June.

Breeds of Horses and Veterinary Obstetrics.

I. Give the strong and weak points of Clydes and Shires respectively.

II. Give the characteristics of the "Suffolk Punch."

III. What qualities has the Cleveland Bay that renders him suitable to produce carriage horses? State what stamp of mare to mate him with in order to get the best results for carriage purposes in Canada.

IV. Why is it advisable to infuse more thoroughbred blood into our light horses in this province? Give opinion as to the stamp of mare suitable to breed to a thoroughbred.

V. Describe the arrangement of the placenta in cows and mares.

VI. Name the four acts by which generation is accomplished, and the organs by which they are effected.

VII. State the causes of sterility, and give the average number of fruitful animals amongst mares, cows and ewes.

VIII. Give the average period of gestation in the mare, cow, ewe, sow and bitch.

IX. Explain how to perform amputation of the fore extremity, and evisceration of the fœtus.

X. Explain how to effect delivery in the following cases: Transverse presentation, one foreleg completely retained, extreme downward deviation of the head towards the abdomen.

English Literature.—Milton's L'Allegro and Il Penseroso.

I. Discuss the poet's selection and treatment of each of the following subjects in the two poems respectively, with quotations: The time of say, time of life, music, the stage, birds, morning scenes.

II. Show the relative importance respectively placed in the two poems on each o the following subjects. Quote where you can, and show the suitability to the prevailing sentiment in each poem:

Day and night, sunshine and gloom, companionship and solitude, the senses and the intellect.

III. Quote and explain the allusions in the poem to each of the following: Cynosure, Hermes, Orpheus, Vesta, Chaucer, Jonson, Plato, Shakespeare.

IV. Explain the following lines occurring in the poem :

The mountain nymph, sweet Liberty.
In weeds of peace high triumphs hold.
And every shepherd tells his tale.
Lap me in soft Lydian airs.
How little you bestead.
Over thy decent shoulders drawn.
But let my due feet never fail
To walk the studious cloister's pale ;
And love the high embowed roof,
With antique pillars massy proof.

V. Point out the poetical and rhetorical peculiarities in each of the following lines :

The frolic wind that breathes the spring.
Till the dappled dawn doth rise.
Where the nibbling flocks do stray.
The laboring clouds do often rest.
Hard by a cottage chimney smokes,
From betwixt two aged oaks.
Then lies him down the lubber fiend.
With wanton head and giddy cunning.
Forget thyself to marble.

Road-making and Levelling.

I. Distinguish *true* and *apparent* level, and find the difference for a distance of (a) 4 miles, (b) $\frac{1}{4}$ mile.

II. Briefly explain the method of determining the levels for an underdrain. Illustrate by a line and table of measurements.

III. If a force of 80 pounds is necessary to draw a load of one ton on the level, find the force necessary on this road to draw a load of $1\frac{3}{4}$ tons up a slope of 1 in 20.

IV. Give detailed instructions for the construction of gravel roads.

V. Would it be well to abolish statute labor? Discuss concisely.

VI. Write an essay on the advantages of good country roads.

Mechanical Department.

I. The length of base of a right angle triangle is 16 ft., the perpendicular is $10\frac{2}{3}$ ft. Give the most extreme ratio of inches on blade and tongue of the steel square that will determine the bevel cuts of either end of the third side, and the number of applications required to produce the length.

II. Describe the condition of the teeth of a ripping saw when it is at its best for medium hard wood, and give the important points that distinguish between a rip and cross-cutting saw. State also the reasons for the difference.

III. What is meant by jointing the teeth of a saw? and describe the manner in which it is done.

IV. There are three bench planes used more frequently in joiner work than any other; give the names, the grinding angle of the basil, and the condition of the cutting edge of each plane respectively.

V. Explain the difference between planing up a piece of stuff and trying up a piece of stuff.

APPENDIX IV.

CLASS LISTS—EASTER EXAMINATIONS, 1892.

FIRST YEAR.

AGRICULTURE.

CLASS I.

1 Ferguson, J. J.
2 Atkinson, Jas.
3 McCallum, Wm.
4 Walker, F.
5 Cornell, J. G.
6 Spencer, J. B.

CLASS II.

1 McKenzie, W. G.
2 Holmes, C. U.
3 Widdifield, J. W.
4 Robertson, Wm.
5 Hunter, H. E.
6 McNaughton, K. / Stewart, J.
8 Dean, F.
9 Burns. J. H.
10 Phin, A. E. / Elmes, W. A.

CLASS III.

1 Lehmann, R. A.
2 McDonald, F. J.
3 Kennedy, P. B.
4 Hamilton, C. A.
5 Phin, G. / Emigh.
7 McCrimmon.
8 Kirk, H.
9 Baird, W. H.
10 Brooks, W. A.
11 McMordie, R.
12 Vanatter, P. O.
13 Kerr, W. C.
14 Farrer, J. W.
15 Grey, F. W. / Findlay, J. H.
17 Burdett, A. H.
18 Hay, J.
19 Ainley, W.

Ferraby, E. L.
Woolley, D.
Wilson, G. H.
Jackson, T. M.

INORGANIC CHEMISTRY.

CLASS I.

1 Atkinson.
2 Ferguson.

CLASS II.

1 McCallum.
2 McKenzie, W. G.
3 Hay. / Kennedy.

CLASS III.

1 Dean. / Spencer.
3 McLean.
4 Walker.
5 Widdifield.
6 Elmes. / Lehmann.
8 Burns, J. H. / McNaughton.
10 Stewart.
11 Brooks. / McMordie.
13 Phin, A. E. / Vanatter.
15 Holmes. / Robertson.

Cornell.
Phin, G.
Kirk.
Ferraby.
Farrer.
Findlay.
McCrimmon.
Hamilton.
Jackson.
Baird.
Hunter.
Burdett.
Woolley.
Wilson.
Emigh.
Ainley.
Grey.
Kerr.

ORGANIC CHEMISTRY.

CLASS I.

1 Ferguson.
2 Atkinson.
3 McKenzie, W. G.
4 McCallum. / Spencer.

CLASS II.

1 Kennedy.
2 Walker. / Widdifield.

CLASS III.

1 Dean.
2 Stewart. / Phin, A. E.
4 McMordie.
5 Hay.
6 Holmes.
7 Elmes.
8 McNaughton.
9 Burns, J. H. / McCrimmon.
11 Lehmann.
12 Kirk. / Hamilton.

Cornell.
Brooks.
Farrer.
Findlay.
Emigh.
Ferraby.
Baird.
Hunter.
Robertson (ægrotat).
Jackson.
Woolley.
Wilson.
Grey.
Phin, G.
Kerr.
Burdett.
Ainley.

ZOOLOGY.

CLASS I.

1 Ferguson.
2 Atkinson.
3 Walker.
4 Cornell. / McCallum.
6 Widdifield.

CLASS II.

1 Hay.
2 Dean.
3 Spencer.
4 Burns.
5 Kennedy.

CLASS III.

1 Ferraby.
2 McKenzie.
3 Stewart. / McMordie.
5 Farrer.
6 McNaughton.
7 Brooks.
8 Lehmann.
9 Phin, A. E.
10 Elmes. / Hamilton.
12 Hunter.
13 Holmes.
14 McCrimmon.
15 Baird.
16 Phin, G.
17 Burdett.
18 Findlay.
19 Kirk.
20 Vanatter.

Emigh.
Robertson.
Wilson.
Jackson.
Grey.
Kerr.
Woolley.
Ainley.

NOTE.—Names unnumbered (below the line) are those of students who failed to pass in the subjects The minimum for first-class (honors) is 75 per cent.; for second-class (honors) 60 per cent.; for third-class (pass) 33 per cent.

CLASS LIST (EASTER EXAMINATIONS).—*Continued.*

FIRST YEAR.

VETERINARY ANATOMY.	GRAMMAR.	ENGLISH LITERATURE.	ARITHMETIC.	GENERAL PROFICIENCY.
CLASS I.	CLASS I.	CLASS I.	CLASS I.	
1 Atkinson. 2 Ferguson.	1 Ferguson. 2 Kennedy. 3 McCallum. Hay.	1 Ferguson. 2 Burns, J. H. Walker. 4 McCallum. 5 Atkinson. 6 Hamilton.	1 Walker. 2 Ferguson. 3 Widdifield. 4 McKenzie. Lehmann. 6 Phin, A. E. 7 Atkinson.	1 Ferguson. 2 Atkinson. 3 McCallum. 4 Walker. 5 Widdifield. 6 Spencer. 7 McKenzie, W. G. 8 Kennedy.
CLASS II.	CLASS II.	CLASS II.	CLASS II.	9 Burns, J. H. 10 Hay.
1 Widdifield. 2 McCallum. 3 McNaughton.	1 Widdifield. 2 Walker. 3 Spencer. 4 Atkinson. 5 McCrimmon. 6 Burns, J. H. 7 Kirk.	1 Widdifield. 2 Spencer. 3 Cornell. 4 Dean.	1 Spencer. Stewart. 3 Kirk. 4 Emigh. 5 McCallum. 6 McCrimmon. 7 Kennedy. Findlay. 9 Hamilton. Holmes. Brooks.	11 Dean. 12 Stewart. 13 Phin, A. E. 14 McNaughton. 15 Holmes. 16 McMordie. 17 Elmes.
CLASS III.	CLASS III.	CLASS III.	CLASS III.	
1 Stewart. 2 Kennedy. 3 Spencer. 4 McMordie. 5 Burns, J. H. 6 Walker. 7 Hay. 8 Hamilton. 9 Phin, A. E. 10 McCrimmon. Robertson. Cornell. 13 Elmes. Holmes. Dean. 16 McKenzie, W. G. Grey. Kirk. Kerr. Brooks. Emigh. Farrer. ——— Vanatter. Hunter. Ferraby. Baird. Phin, G. Lehmann. Burdett. Findlay. Ainley. Wilson. Woolley. Jackson.	1 McKenzie, W. G. 2 Phin, A. E. 3 Hamilton. 4 Elmes. 5 Holmes. McMordie. 7 Dean. 8 Farrer. 9 McNaughton. 10 Robertson. 11 Hunter. Grey. 13 Burdett. 14 Brooks. Lehmann. 16 Cornell. Emigh. 18 Stewart. ——— Kerr. Findlay. Baird. Ferraby. Jackson. Phin, G. Wilson. Woolley. Ainley.	1 McKenzie, W. G. 2 Hay. 3 McCrimmon. 4 Ferraby. 5 Farrer. 6 Hunter. 7 Elmes. Holmes. 9 Burdett. Kennedy. 11 McNaughton. 12 Robertson. 13 Kirk. McMordie. 15 Lehmann. 16 Emigh. Grey. 18 Phin, A. E. 19 Stewart. ——— Brooks. Baird. Phin, G. Findlay. Wilson. Ainley. Jackson. Kerr. Woolley.	1 Burns, J. H. 2 Hay. 3 McNaughton. 4 Ferraby. 5 Elmes. 6 Kerr. 7 McMordie. Phin, T. 9 Cornell. 10 Hunter. 11 Robertson. Dean. 13 Vanatter. Grey. 15 Burdett. ——— Jackson. Baird. Farrer. Ainley. Woolley. Wilson.	

CLASS LISTS (EASTER EXAMINATIONS).—*Continued.*

SECOND YEAR.

AGRICULTURE.

CLASS I.

1 Shaw, R. S.
2 Soule, A. McNairn
3 Harcourt, R.
4 Curzon, S. R.
5 Crealy, J. E.
6 Wiancko, A. T.

CLASS II.

1 Dyer, W. D.
2 Beckett, H. L.
3 Story, H.
4 Day, G. E.
5 Gies, N.
  Hurley, T. J.
7 Honsberger, J. D.
8 Silverthorn, C.
9 Graham, W. R.
  Tolton, J. E.
11 Carlaw, W.
  Aylsworth, D.

CLASS III.

1 Brown, B. C.
2 Harvey, W. H.
3 Yuill, A. R.
4 Eaton, L. W.
5 Ruthven, W. A.
6 Burns, J. A. S.
7 Carpenter, F.C.S.
8 Curzon, A. R.

PRACTICAL CATTLE.

CLASS I.

1 Soule.
2 Shaw.
  Yuill.

CLASS II.

1 Ruthven.
2 Bell.
3 Harcourt.
4 Honsberger.
5 Carpenter.
  Day.
7 Aylsworth.
8 Dyer.
  Graham.
10 Gies.

CLASS III.

1 Crealy.
  Harvey.
3 Beckett.
4 Tolton.
  Wiancko.
6 Curzon, A.
7 Hurley.
8 Brown.
9 McDonald.
10 Eaton.
  Silverthorn.
12 Carlaw.
  Story.
14 Curzon, S.
15 Burns, J. A. S.

Bealey, H. B.

PRACTICAL SHEEP.

CLASS I.

1 Day.
2 Ruthven.
3 Harcourt.
  Shaw.
5 Dyer.
6 Tolton.
7 Beckett.

CLASS II.

1 Soule.
  Yuill.
3 Story.
4 Aylsworth.
  Graham.
6 Wiancko.

CLASS III.

1 Crealy.
2 Hurley.
3 Curzon, S.
4 Curzon, A.
5 Eaton.
6 Honsberger.
7 Gies.
8 Harvey.
9 Carlaw.
10 McDonald, F. J.
11 Silverthorn.
12 Brown.
13 Carpenter.

Burns, J. A. S.

AGRICULTURAL CHEMISTRY.

CLASS I.

1 Crealy.
2 Day.
3 Dyer.
4 Harcourt.
5 Beckett.
  Shaw.

CLASS II.

1 Burns.
2 Wiancko.
3 Harvey.
4 Gies.
  Eaton.
6 Curzon, S.

CLASS III.

1 Honsberger.
2 Hurley.
  Graham.
4 Silverthorn.
5 Carpenter.
6 Brown.
7 Tolton.
8 Story.
  Soule.
10 Ruthven.
11 Yuill.
12 Carlaw.
13 Aylsworth.
14 Curzon, A.

ENTOMOLOGY.

CLASS I.

1 Curzon, S.
2 Beckett.
3 Soule.
4 Shaw.
5 Dyer.
6 Day.
7 Crealey.
8 Carpenter.
9 Hurley.
10 Harcourt.
11 Brown.

CLASS II.

1 Eaton.
2 Ruthven.
3 Honsberger.
4 Wiancko.
5 Story.

CLASS III.

1 Harvey.
2 Burns, J. A. S.
3 Graham.
4 Silverthorn.
5 Carlaw.
6 Yuill.
7 Tolton.
  Gies.
9 Aylsworth.
11 Curzon, A.

CLASS LISTS (EASTER EXAMINATIONS).—*Concluded.*

SECOND YEAR.

DISEASES OF DOMESTIC ANIMALS.	PRACTICAL HORSE.	LITERATURE.	POLITICAL ECONOMY.	PROFICIENCY.
CLASS I.	CLASS I.	CLASS I.	CLASS I.	1 Shaw.
1 Day	1 Day.	1 Day.	1 Day.	2 Day.
2 Shaw.	2 Beckett.	2 Soule.	2 Shaw.	3 Beckett.
3 Beckett.	3 Shaw.	3 Shaw.	3 Soule.	4 Soule.
4 Soule.	4 Hurley.	4 Curzon, S.		5 Harcourt.
5 Wiancko.	5 Silverthorn.	5 Honsberger. Eaton.		6 Dyer.
				7 Crealy.
CLASS II.	CLASS II.	CLASS II.	CLASS II.	8 Curzon, S.
1 Curzon, S.	1 Ruthven.	1 Beckett. Carpenter. Burns, J. A. S.	1 Curzon, S.	9 Wiancko.
2 Crealy.	2 Brown.		2 Dyer. Crealy.	10 Honsberger.
3 Gies.	3 Harcourt.		4 Burns, J. A. S.	11 Gies.
4 Dyer.	4 Yuill.	4 Harcourt. Harvey.	5 Beckett. Harcourt.	12 Eaton.
5 Silverthorn.	5 Wiancko.	6 Story.		13 Harvey.
	6 Aylsworth.			14 Hurley.
	7 Story.			15 Silverthorn.
	8 Soule.			16 Story.
	9 Eaton.			17 Ruthven.
	10 Graham.			18 Carpenter.
	11 Carlaw.			19 Aylesworth.
				20 Brown.
	CLASS III.	CLASS III.	CLASS III.	21 Yuill.
CLASS III.	1 Tolton.	1 Dyer.	1 Gies.	22 Carlaw.
1 Harcourt.	2 Honsberger.	2 Silverthorn.	2 Harvey.	23 Tolton.
2 Honsberger.	3 Gies.	3 Wiancko.	3 Carlaw.	
3 Hurley.	4 Crealy.	4 Crealy.	4 Eaton.	
4 Carlaw.	5 Dyer.	5 Hurley.	5 Wiancko. Silverthorn.	
5 Aylsworth.	6 Harvey.	6 Aylsworth. Gies. Carlaw.	7 Aylsworth.	
6 Eaton.	7 Curzon, S.		8 Honsberger. Ruthven.	
7 Harvey.	8 Curzon, A.	9 Brown.	10 Yuill.	
8 Story.	9 Carpenter.	10 Tolton.	11 Brown.	
9 Ruthven.	10 Burns.	11 Moody. Ruthven.	12 Story.	
10 Tolton.		13 Yuill.	13 Tolton.	
11 Carpenter.			14 Carpenter.	
12 Brown.		———	15 Moody.	
13 Yuill.		Graham.	16 Hurley.	
14 Graham.		Curzon, A.	———	
———			Curzon, A.	
Curzon, A.			Graham.	
Burns.				

CLASS LISTS.

Midsummer Examinations, 1892.

FIRST YEAR.

Agriculture.

Class I.

1 Atkinson.
2 Ferguson.
3 McCallum.
4 Walker.
5 Robertson.
6 Stewart. / Widdifield.
8 Spencer.
9 McKenzie.
10 Dean.

Class II.

1 Findlay.
2 McNaughton.
3 Holmes. / McCrimmon.
5 McMordie.
6 Beard. / Hunter. / Kennedy.

Class III.

1 Hamilton. / Phin, A. E.
3 Lehmann.
4 Elms.
5 Burns.
6 Kiely.
7 Elford. / Brooks. / Phin, G.
10 Maclean.
11 Emigh.
12 Ainley.
13 Farrer.
14 Kerr. / Kerraby. / Woolley.
17 Kirk.
18 Hay.
19 Burdett.
20 Jackson. / Wilson.
22 Grey.

Dairying.

Class I.

1 Ferguson.
2 Atkinson.
3 Spencer.

Class II.

1 McKenzie.
2 Robertson.
3 Dean.
4 Widdifield.
5 Kennedy.
6 McCallum. / Holmes.
8 Walker.
9 McMordie.
10 McCrimmon.

Class III.

1 Elmes.
2 McNaughton.
3 Kirk.
4 Hay.
5 Phin, A.
6 Hamilton.
7 Maclean. / Stewart.
9 Lehmann. / Ferraby.
11 Hunter, H. E. / Brooks.
13 Burdett.
14 Findlay.
15 Baird.
16 Elford.
17 Burns.
18 Emigh.
19 Wilson.
20 Kerr. / Woolley.
22 Ainley. / Phin, G. / Farrer. / Grey. / DeHart.

Jackson.
Hallett.

Materia Medica.

Class I.

1 Ferguson.
2 Atkinson.
3 Widdifield.
4 Maclean.

Class II.

1 Spencer.
2 McKenzie.
3 McCallum.
4 Walker.

Class III.

1 Kennedy.
2 Holmes.
3 Lehmann. / McMordie.
5 Dean.
6 Hunter.
7 Burns.
8 McCrimmon.
9 Stewart.
10 Robertson.
11 Hamilton.
12 Kirk. / McNaughton.
14 Hay.
15 Findlay. / Brooks.
17 Baird.
18 Farrer. / Phin, A. E.
20 Gray.
21 Elmes.

Ferraby.
Kerr.
Elford.
Phin, G.
Burdett.
Emigh.
Wilson.
Jackson.
Ainley.
Woolley.
Hallett.
Kiely.

Botany.

Class I.

1 Ferguson.
2 Atkinson.
3 McCallum.
4 Walker.
5 Widdifield.
6 Spencer.
7 McKenzie.

Class II.

1 Maclean.
2 Hay. / Kennedy.
4 Phin, A.
5 Burns, J. H.
6 Dean.
7 Stewart.
8 Holmes.

Class III.

1 McCrimmon.
2 Farrer.
3 McMordie.
4 Lehmann.
5 Elmes.
6 Hunter, H. E.
7 McNaughton.
8 Ferraby.
9 Robertson.
10 Findlay.
11 Hamilton.
12 Kirk. / Phin, G.
14 Brooks.
15 Elford.
16 Baird.

Emigh.
Grey.
Jackson.
Burdett.
Wilson.
Woolley.
Kiely.
Ainley.
Kerr.

Geology.

Class I.

1 Ferguson.
2 Atkinson.
3 Widdifield.
4 McCallum.

Class II.

1 Kennedy.
2 McKenzie.
3 Maclean.
4 Walker.
5 Spencer.
6 Dean.

Class III.

1 Phin, A.
2 McMordie.
3 Lehmann.
4 Stewart.
5 Holmes.
6 Farrer.
7 Robertson.
8 McCrimmon.
9 Elmes.
10 Hay.
11 McNaughton.
12 Burns.
13 Emigh.
14 Kirk. / Elford.
16 Ferraby.
17 Brooks.
18 Findlay.

CLASS LISTS (MIDSUMMER EXAMINATIONS).—*Continued.*

FIRST YEAR.

LITERATURE.	GRAMMAR AND COMPOSITION.	MENSURATION.	BOOK-KEEPING.	GENERAL PROFICIENCY.
CLASS I.	CLASS I.	CLASS I.	CLASS I.	
1 Ferguson. 2 Atkinson. 3 McKenzie. 4 Widdifield. 5 McCallum. 6 Walker. 7 Spencer.	1 McCallum.	1 Atkinson. 2 Ferguson. 3 Phin, A. E. 4 Lehmann. 5 McKenzie.	1 Atkinson. 2 Ferguson. Walker. 3 Spencer.	1 Ferguson. 2 Atkinson. 3 McCallum. 4 McKenzie. 5 Walker. 6 Widdifield 7 Spencer. 8 Kennedy. 9 Dean. 10 Phin, A. E. 11 Holmes. 12 Lehmann. 13 McCrimmon. 14 Hay. Robertson. 16 McMordie. 17 Stewart. 18 Burns. 19 Elmes. 20 McNaughton. 21 Kirk. 22 Findlay.
CLASS II.	CLASS II.	CLASS II.	CLASS II.	
1 Burns. Dean. 3 Kennedy. 4 Robertson. 5 Ferraby. 6 Hay.	1 Ferguson. 2 Widdifield. Hay.	1 McCallum. 2 Walker. 3 Spencer. 4 Hay. Widdifield.	1 McCallum. Holmes. 3 McKenzie. 4 McCrimmon. 5 Burns. Widdifield. Lehmann. 8 Hay. Phin.	
CLASS III.	CLASS III.	CLASS III.	CLASS III.	
1 Elmes. McCrimmon. Lehmann. 4 McNaughton. Holmes. 6 Maclean. 7 Hunter. McMordie. 9 Kirk. 10 Phin, A. E. 11 Stewart. 12 Hamilton. 13 Findlay. 14 Emigh. Elford. 16 Brooks. 17 Phin, G. 18 Baird. 19 Farrer. 20 Kerr. Burdett.	1 Hamilton. 2 McKenzie. 3 Spencer. 4 Atkinson. 5 Walker. 6 Kennedy. 7 McMordie. 8 McCrimmon. 9 Grey. 10 Maclean. Phin, A. E. 12 Elford. 13 Elmes. Lehmann. 15 Burdett. Burns. Holmes. Dean. Robertson. McNaughton. Stewart. Findlay,	1 Kirk. Emigh. 3 Elmes. 4 Hamilton. 5 McCrimmon. 6 Holmes. 7 McMordie. 8 Robertson. 9 Findlay. 10 McNaughton. 11 Maclean. 12 Dean. Grey. 14 Stewart. Burns. Brooks. Kennedy. Elford. Hunter. Kerr. Phin, G.	1 Dean. Elmes. 3 Findlay. 4 Kirk. 5 Kennedy. Robertson. 7 Brooks. 8 Stewart. 9 McMordie. 10 McNaughton. Hunter. 12 Hamilton. 13 Ferraby. Emigh. Phin, G. 16 Elford. Kerr.	
Kiely. Woolley. Wilson. Grey.	Emigh. Kirk. Farrer. Phin, G. Hunter. Brooks. Kerr. Jackson. Hallett. Baird. Woolley. Kiely. Wilson. Ainley.	Hallett. Baird. Farrer. Kiely. Ferraby. Woolley.	Farrer. Maclean. Burdett. Baird. Jackson. Kiely. Woolley. Hallett. Ainley.	

CLASS LISTS (MIDSUMMER EXAMINATIONS)—*Continued.*

SECOND YEAR.

LIVE STOCK AND FORESTRY.	DAIRYING.	ANALYTICAL CHEMISTRY.	BOTANY.	PRACTICAL HORTICULTURE.
CLASS I.	CLASS I.	CLASS I.	CLASS I.	
1 Shaw.	1 Day.	1 Day.	1 Bell.	
2 Soule.	2 Shaw.	2 Dyer.	2 Shaw.	
3 Wiancko.	3 Dyer.	3 Gies.	3 Day.	
4 Day.	4 Beckett.	4 Crealy. Bell. Beckett.	4 Dyer.	
5 Yuill.	5 Harcourt.	7 Graham. Wiancko.		
6 Dyer. Hurley.		9 Yuill. Ruthven.		
CLASS II.	CLASS II.	CLASS II.	CLASS II.	CLASS II.
1 Beckett.	1 Eaton.	1 Tolton. Burns.	1 Soule.	1 Soule.
2 Silverthorn.	2 Soule.	3 Aylsworth.	2 Curzon, S.	2 Shaw.
3 Bell. Gies. Graham. Harcourt. Honsberger. Story.	3 Gies.	4 Shaw.	3 Harcourt.	3 Day.
	4 Harvey.	5 Carpenter.		4 Bell.
	5 Hurley.	6 Harvey.		5 Curzon, S. Harcourt.
9 Harvey.				7 Dyer.
10 Ruthven.				8 Beckett.
11 Aylsworth. Carlaw.				9 Crealy.
13 Eaton.				
14 Tolton. Crealy.				
CLASS III.	CLASS III.	CLASS III.	CLASS III.	CLASS III.
1 Curzon, S.	1 Carlaw.	1 Curzon, S.	1 Hurley.	1 Hurley.
2 Burns.	2 Wiancko. Honsberger.	2 Curzon, A.	2 Carlaw.	2 Gies.
3 Moody.	4 Tolton.	3 Honsberger.	3 Wiancko. Gies.	3 Ruthven.
4 Brown.	5 Crealy.	4 Eaton.	5 Beckett.	4 Harvey.
5 Carpenter.	6 Aylsworth.	5 Carlaw. Harcourt. Soule.	6 Graham.	5 Yuill.
6 Curzon, A.	7 Yuill.	8 Hurley.	7 Crealy.	6 Story. Carlaw.
	8 Bell. Burns.	9 Story.	8 Aylsworth. Eaton.	8 Wiancko.
	10 Ruthven.	10 Moody.	10 Yuill.	9 Aylsworth.
	11 Graham.	11 Silverthorn.	11 Carpenter.	10 Honsberger. Carpenter.
	12 Silverthorn.	12 Brown.	12 Brown.	12 Graham.
	13 Moody.		13 Story.	13 Eaton.
	14 Story.		14 Harvey.	14 Brown.
	15 Brown.		15 Honsberger.	15 Curzon, A.
	16 Carpenter.		16 Ruthven.	16 Silverthorn.
	17 Curzon, S.		17 Silverthorn. Tolton. Burns.	17 Tolton.
	18 Curzon, A.			18 Burns.
	De Hart.		Curzon, A. Moody.	Moody.

CLASS LISTS (MIDSUMMER EXAMINATIONS)—*Concluded.*

SECOND YEAR.

BREEDS OF HORSES AND VETERINARY OBSTETRICS.	LITERATURE.	ROAD-MAKING.	GENERAL PROFICIENCY.
CLASS I.	CLASS I.	CLASS I.	
1 Day.	1 Soule.	1 Day.	1 Day.
2 Beckett.	2 Day.	2 Shaw.	2 Shaw.
3 Shaw.	3 Shaw.	3 Beckett. Harcourt.	3 Beckett.
		5 Dyer.	4 Dyer.
		6 Bell.	5 Bell.
		7 Honsberger.	6 Soule.
		8 Carpenter.	7 Harcourt.
		9 Soule.	8 Wiancko.
			9 Gies.
			10 Graham.
CLASS II.	CLASS II.	CLASS II.	11 Crealy.
			12 Hurley.
1 Silverthorn.	1 Beckett.	1 Burns. Graham.	13 Burns.
2 Bell.	2 Carpenter.	3 Carlaw.	14 Yuill.
3 Harcourt.	3 Curzon, S.	4 Crealy. Wiancko.	15 Carpenter.
4 Soule.	4 Harcourt.	6 Gies.	16 Silverthorn.
5 Gies.	5 Silverthorn. Dyer.	7 Hurley. Eaton.	17 Harvey.
	7 Burns.		18 Carlaw.
	8 Bell. Harvey.		19 Curzon, S.
			20 Ruthven.
			21 Aylsworth.
			22 Eaton.
CLASS III.	CLASS III.	CLASS III.	23 Story.
			24 Tolton.
1 Burns.	1 Wiancko.	1 Aylsworth.	25 Honsberger.
2 Wiancko.	2 Brown.	2 Moody. Yuill.	26 Brown.
3 Honsberger.	3 Crealy.	4 Silverthorn.	
4 Carpenter.	4 Honsberger.	5 Story.	
5 Story.	5 Eaton.	6 Harvey.	
6 Curzon, S.	6 Ruthven. Yuill.	7 Ruthven. Brown.	
7 Carlaw.	8 Story.	9 Curzon, S.	
8 Moody.	9 Hurley.	10 Tolton.	
9 Dyer.	10 Graham.	11 Curzon, A.	
10 Graham.	11 Moody.		
11 Aylsworth.	12 Gies.		
12 Brown.	13 Tolton.		
13 Hurley.	14 Carlaw.		
14 Eaton.	15 Aylsworth.		
15 Crealy.			
16 Tolton.			
17 Ruthven.			
18 Yuill.			
19 Curzon, A.	Curzon, A.		
20 Harvey.			

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